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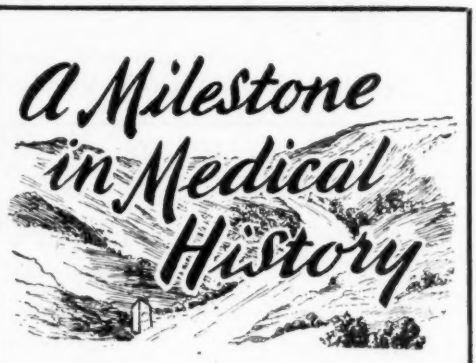

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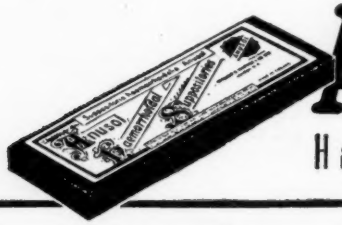

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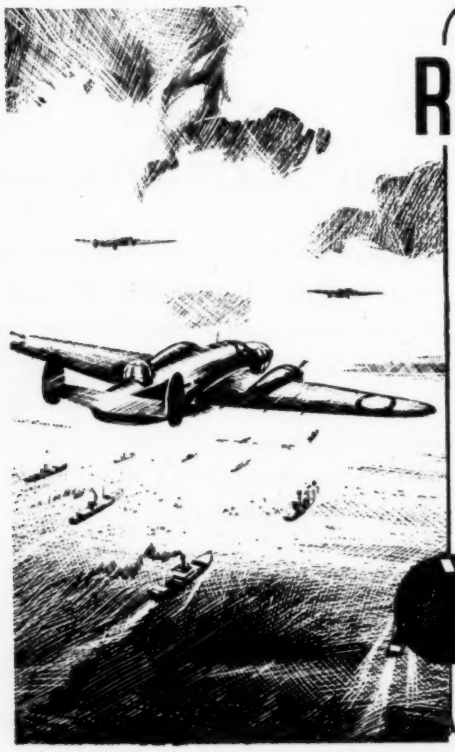

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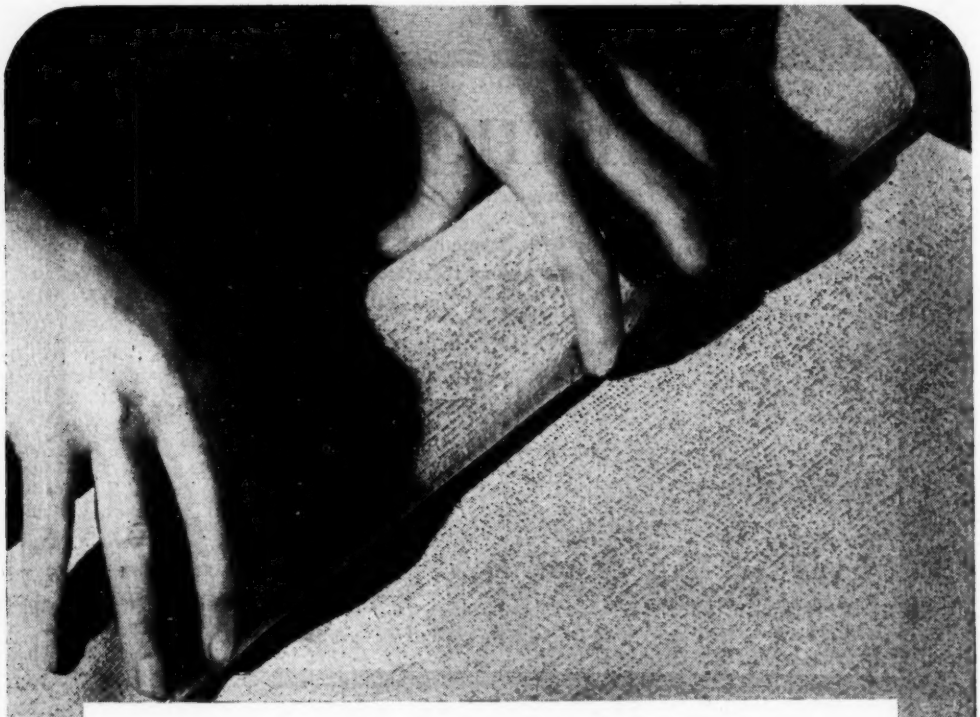

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PLASMA FIXATION OF SKIN GRAFTS

J. EASTMAN SHEEHAN, M D YALE, F A C S
PROFESSOR OF PLASTIC REPARATIVE SURGERY, NEW YORK POLYCLINIC MEDICAL SCHOOL

THE covering of defects by free full-thickness skin-grafts has been developed, during the past 20 years, from a status in which there was no more than a 50% success, with small grafts, to one in which, even with large grafts, there is hardly ever a failure. Contributory to this improvement was the recognition, first, that restoration in the moribund graft was effected by arterial infiltration from the tissues of the base, and secondly that pressure must be adapted to promotion of such infiltration—not too little, or the contact would be broken, not too much, or the arterioles could not penetrate. It was observed that the infiltration went better when excision was made not only of the subcutaneous fat but also a segment of the corium.

A graft of this kind was cut to the pattern of the defect. It shrank, and must therefore be sutured in place, necessarily under tension.

ADHESION BETWEEN GRAFT AND HOST

At first it was assumed that the graft, when raised, should be washed in saline solution, to get rid of the serum. In my own experience, it was clearly better to allow it to rest a while in its own serum and that of the donor area. Such sera were a temporary protection against infection, and ensured a fibrinous adhesion between graft and host during what might be a critical 24 hours or more.

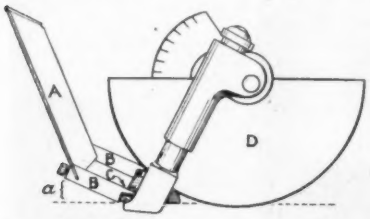


Fig. 1—Elevation of mirror above plane of skin. In cutting this elevates the mirror above the cut section of skin in order not to drag over it. D = Padgett's dermatome. A = mirror. B = mirror posts. C = knife clips. a = angle of elevation.

The Belgian scientist Sano[1] enlarged upon this last factor to an extent that quite probably has altered the whole technical plan. If the host is painted with plasma and the graft with leucocytes, adhesion is promoted, sutures become unnecessary, the degree of pressure is no longer a problem, and the circulation within the graft is established so rapidly that overlapping edges bleed when cut on the 2nd day. On the 14th day, as a rule, definite recovery is achieved, and in 2 months the graft is indistinguishable, in colour or by its boundaries, from the neighbouring skin. As this applies to every order of graft (and to some other conditions) the method constitutes a revolutionary advance in the art of skin-grafting.

The patient supplies his own plasma and cell extract. As a working detail, it is well to mention that this should be at the time of operation. If the blood which provides them is taken the day before, it loses some of its restorative quality by the time it is used; and as the amount is only 5 c.cm., its being taken at operation can have no ill effect.

The blood is withdrawn by an aspiration needle from the vein into a syringe of 10 c.cm. capacity. To maintain its fluidity when under treatment later, 1 mg. of heparin and 1 c.cm. of Tyrode's solution[2] are placed in the syringe before the aspiration.

To keep them sterile, the contents of the syringe are siphoned to a centrifuge tube. This tube is centrifuged rapidly for 20 min. by any electrical apparatus. There will then be a physical division of the blood, the clear plasma on top, and a thin film of leucocytes below. The plasma is drawn off by hand syringe and inserted in another tube, leaving the red and white cells in the first tube. The film of white cells is now scooped off and inserted in another tube. To this are added 1·5 c.cm. of Tyrode's solution and some glass beads to facilitate shaking of the contents. The tubes containing plasma and cell extract are set in cool water.

The amounts are sufficient for a full thickness graft up to 10 × 10 in.

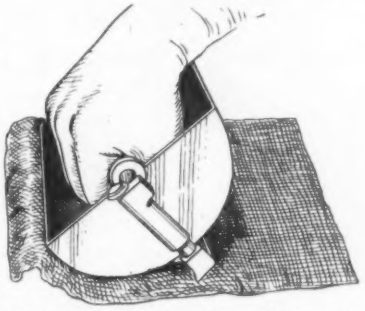


Fig. 2—Applying tulle to the drum. The convex surface, sides, and inner surfaces of the ends are painted with rubber cement. The tulle is then rolled on the convex surface and pasted to the sides and inner surfaces of the ends.

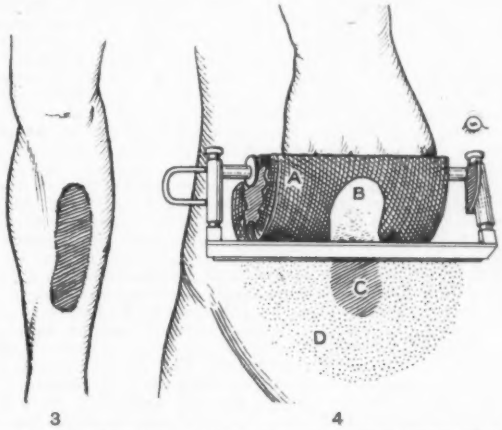
The recipient area is painted with the plasma with a light camel-hair brush. The raw underside of the graft is similarly painted with the cell extract from the other tube. If infection threatens, as in war wounds, the recipient area is also treated with a sulphonamide, or penicillin plasma.

The graft (with its cell extract) is now imposed on the base (with its plasma). The prothrombin in the cell extract, when in contact with the plasma, is converted into thrombin. This, acting upon the fibrinogen in the plasma, converts it into fibrin (Sano).

A fibrin matrix is recognised as an important contribution to the cultivation of living cells. That this is accelerated in some way by the presence of the leucocytes or other elements of the cell extract has been amply demonstrated. Further research will no doubt account for possession by the leucocytes of a function not hitherto ascribed to them. That the plasma alone will effect adhesion was demonstrated on one occasion when the tube containing the cell extract dropped and the contents were lost. It is in the acceleration of the restorative process that the action of the leucocytes becomes effective.

CUTTING THE GRAFT

In the early tests of this method it was assumed that, since no sutures were necessary, the graft should be permitted to overlap the skin edges of the defect. That, evidently, does not make the best ultimate result. Clipping away the overlap does not give a good line of apposition. On the face, a faulty line would be a disfigurement. The overlap dies about the 5th day, leaving a secondary problem of approximation, for



3 4

Fig. 3—The recipient area. A pattern is taken from it and outlined on the skin at C in fig 4.

Fig. 4—Cutting the graft. A = rubberised tulle. B = graft adhering to the tulle. C = raw area from which the graft was cut. D = powdered area.

1. Sano, M. E. *Surg. Gynec. Obstet.* 1943, **77**, 510.
2. Tyrode's solution consists of sodium chloride, 8·0 g; potassium chloride, 0·2 g.; calcium chloride, 0·2 g.; magnesium chloride, 0·1 g.; sodium acid phosphate 0·05 g.; sodium bicarbonate, 1·0 g.; glucose, 1·0 g.; with distilled water added to make 1000 c.cm. Filtered through Berkefeld filter "W."

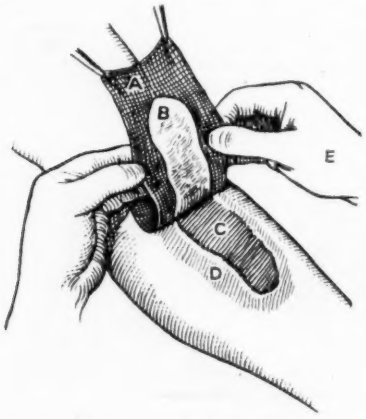


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Fig. 5—Applying the graft. Fig. 6—Graft in place. The rubberised tulle is pasted to the rubberised skin round the recipient area.

which, with proper handling in the first place, there is no need.

On the other hand, the graft, as formerly made to exact pattern, does not answer our purpose. Its relation to the base was established by tension sutures and by pressure bandage, but now there are no sutures and no bandage. I have accordingly devised the following procedure.

The borders of the surface to be excised are marked off, and markings are also made at points on the periphery to serve later as guides to imposition of the graft. After incision on the line thus marked, followed by excision of the skin by careful dissection, a pattern of the defect is made with lint laid over the defect and absorbing its blood and serum. Marks corresponding to those outside the borders are made on the pattern, which is then transferred to the donor area, where the borders are marked (figs. 3 and 4). Marks are also made corresponding to those at the defect for location of the graft. The donor surface within the pattern markings is cleansed with ether and smeared with rubber cement. Outside the pattern edges the skin is covered with talcum powder.

A dermatome with mirror attachment (Jenney type) has been prepared in advance (fig. 1). First a coat of rubber cement is applied to the drum, then a layer of tulle is rolled on the drum, large enough to overlap the ends and sides (fig. 2). The tulle is then saturated with another coat of rubber cement. The drum thus prepared is autoclaved at 20 lb. pressure, at 240° F., up to 40 minutes, the rubber being vulcanised in the process. The drum thus prepared is applied under brief pressure to the skin, to be certain of adhesion between the two rubber-cemented surfaces. The dermatome process is then brought into action, and at its conclusion the graft, faithful to pattern markings, is adherent to the tulle on the drum (fig. 4). Position markings are again noted, and the tulle, with a border around the graft, is ready to detach.

Meantime an assistant has prepared the defect for reception of the graft, has cleansed the adjoining skin, and has applied thereto a coat of rubber cement. With the rubberised fabric held up by an assistant, the operator, beginning from one of the key markings, guides the graft to its place, and using both hands conforms it to the defect, while securing accurate contact between the overlapping fabric and the rubber-coated skin beyond the defect (fig. 5). By looking along the under surface of the graft as contact is made, accurate fixation and approximation are assured (fig. 6). If the recipient surface is uneven—e.g., on forehead, eyelids, cheek and nose—the assistant guards against formation of air-spaces at the irregularities by light pressure with cotton-wool. It is to be noted that rubber gloves, if used at this stage, would stick to the rubberised fabric. Also that division of labour, as between preparing the plasma and cell extract, dissection and preparation of the recipient area, and obtaining the fabric-covered graft, materially shortens the time devoted to the entire procedure.

Some slight separations and bleb-formations in cases where large areas were grafted showed that some sort of pressure would be beneficial. Bandage gauze can be applied and removed in two days. By that time the graft has taken and the bandages can be removed.

The process of recovery is interesting to watch. At first the graft is a dead white. After about 4–5 hours the graft takes on a purplish tinge. In rather more than 24 hours there are definite signs of life. After the 2nd day it is a full purple. From then until the 7th day the purple is mottled with lighter tones. On the 4th or 5th day there are patches reminiscent of sunlight exposure, but these seem to have no deleterious effect. On the 10th day the graft is a light pink, and on the 14th a definite pink. From then on the progress is to a normal skin colour, and in 2 months the graft is indistinguishable from its surrounding (figs. 7–9).

Since this goes on in the open, not under the concealment of bandages, certain precautions are necessary, especially when the graft is a large one. A hood with a 'Cellophane' window may be applied. The patient does best in a room kept at body temperature. He should be segregated if possible.

In the case of one patient, with a very large graft on the leg, it was found advisable to provide a hood under the bed

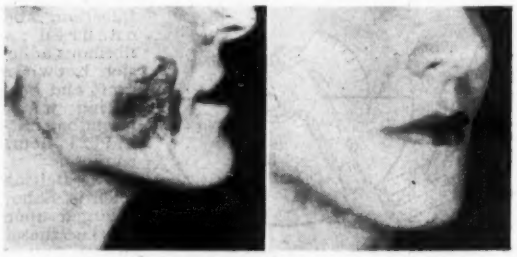

Fig. 7

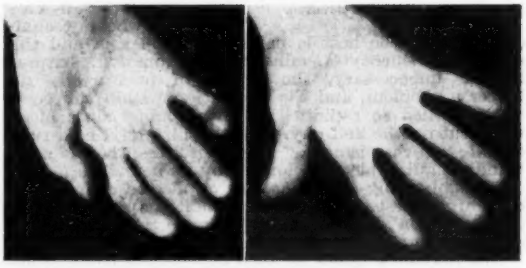

Fig. 8

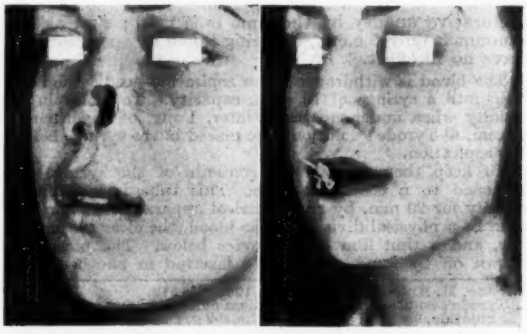

Fig. 9

Figs. 7–9—Before and after grafting.

clothes, to keep the ankles apart with a rod and to prevent scratching by restricting motion of the arms.

CONCLUSION

This compound of plasma and cell extract certainly adds to the resources of the surgical armoury. It should be invaluable for those facial injuries where there are flaps of torn skin whose immediate return is of high importance. Also in the elimination of disfiguring scar. It should make possible the closure of many not-too-large wounds without suture. It offers great hope of various application in many situations with which reparative surgery is from time to time confronted.

HEPATITIS AFTER YELLOW FEVER INOCULATION

RELATION TO INFECTIVE HEPATITIS

G. M. FINDLAY, CBE, MD, DSC EDIN., MRCP
BRIGADIER

N. H. MARTIN
BM OXFD, MRCP, FRIC
MAJOR RAMC

J. B. MITCHELL
MB LOND., MRCS
CAPTAIN RAMC

II. IMMUNOLOGY AND EPIDEMIOLOGY

IN the first section of this paper* an account was given of the clinical and pathological findings in an outbreak of hepatitis following the injection of icterogenic yellow fever vaccine, and a comparison was made with infective hepatitis. No difference could be found between the two conditions apart from the longer incubation period of postinoculation jaundice. It was pointed out, however, that this apparent discrepancy disappears when the incubation period of infective hepatitis following subcutaneous injection and the incubation period of post-inoculation jaundice following intranasal instillation are considered. The epidemiological and experimental investigations described here also tend to show that infective hepatitis and postinoculation hepatitis are due either to the same or to closely related agents.

It has often been said that no example of the spread of jaundice to contacts has been observed from cases of postinoculation hepatitis. From this it has been assumed, perhaps prematurely, that postinoculation jaundice cannot be transmitted to contacts. But the fact that the causal agent can be obtained from the naso-pharynx (Findlay and Martin 1943) is evidence of the possibility of spread of postino-culation jaundice from man to man.

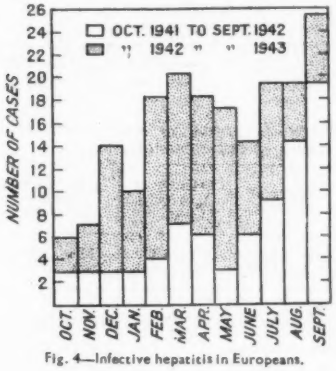

Fig. 4—Infective hepatitis in Europeans.

SPREAD OF INFECTION

Table VI and fig. 4 show that there were more than twice as many cases of infective hepatitis in the 4 months February to May, 1943, than in the corresponding months of 1942 in persons who could not have contracted the disease outside West Africa. The number of troops at risk had not altered materially. Now the outbreak of hepatitis from the icterogenic yellow fever vaccine began in December, 1942, and ran until June, 1943. There was thus an absolute increase in cases of infective hepatitis which when superimposed on the incidence of hepatitis following inoculation, dove-tailed with it in a way that suggested a secondary spread of infection by contacts. Further, the cases of infective hepatitis notified came almost without exception from units, scattered over a wide area, where hepatitis following inoculation was rife. The increased incidence of infective hepatitis among Europeans was not restricted to any one area as was the case in August and September, 1942, when the incidence was also increased. The incidence of infective hepatitis among African troops did not show any particular rise in association with the occurrence of postinoculation jaundice in Europeans. The rise in European cases in August and September, 1942, was, however, associated with a general rise in the African rate.

The following are two suggestive examples of spread from primary inoculated personnel to contacts.

First Example.—In November, 1942, a new unit of African troops was being formed : 60 European officers and men were sent direct from the United Kingdom to complete establishment. They were inoculated against yellow fever on Oct. 20 and 21, 1942, and arrived at their destination in a group on Nov. 18. Six other officers, drawn from different areas in the command, were drafted to the unit at the same time. Two of these had been inoculated in England in May, 1942, and 4 in West Africa, none of the batches of vaccine used for inoculation of these 6 officers being icterogenic.

The battalion was stationed initially in a relatively isolated area having only infrequent contact with other units. The first person to fall sick with postinoculation hepatitis did so on Dec. 17, 1942. He was an officer from the group that had come direct from the UK. From then on cases occurred continuously among the inoculated personnel until Feb. 18, 1943. In all, 41 cases of frank jaundice were seen by the RMOs in that time, and 4 in which preicteric symptoms were present though jaundice never developed. On Jan. 6, 1943, the Commanding Officer, who had joined the unit late in November, 1942, from another colony, complained to the RMO of anorexia and nausea ; his urine was found to contain traces of bile and his stools were pale. Two days later, Jan. 8, jaundice was detected clinically. Icterus persisted for 14 days ; though the officer insisted on continuing with his administrative work he was clearly a mild case of hepatitis. On the same day as the CO, Jan. 6, a second among the officers drafted from units within the command fell ill with anorexia, a bad taste in the mouth, and other symptoms suggestive of the preicteric stage of jaundice. Bile was found in his urine though no certain icterus was ever demonstrated clinically. The symptoms lasted for ten days when recovery was spontaneous. A third of the officers drafted locally had joined the unit in December, 1942. He fell ill on April 13, 1943 ; an initial diagnosis of malaria was tentatively made but repeated blood-films were negative for malaria parasites and he showed no response to therapeutic doses of quinine. On April 19, anorexia was the dominant symptom with epigastric pain ; on April 22 the officer was definitely jaundiced ; the urine had first been noticed to be dark on April 20. By May 10, after a moderately severe attack, symptoms began to abate.

In addition to these 3 officers, 2 Africans, who by reason of their work were in close contact with the Europeans, developed jaundice on Jan. 1 and Feb. 5, 1943. The second African became desperately ill and died of acute necrosis of the liver. His liver was used in the preparation of the first batch of liver antigen for complement fixation. No other Africans fell sick with jaundice from this unit in the period under review.

TABLE VI—INCIDENCE OF INFECTIVE HEPATITIS AND POST-INOCULATION JAUNDICE IN EUROPEANS

Year and month	Cases of infective hepatitis	Cases of postinoculation jaundice	Year and month	Cases of infective hepatitis	Cases of postinoculation jaundice
1941			1942 (*cont.*)		
Aug. ..	5	..	Oct. ..	3	..
Sept. ..	3	..	Nov. ..	4	..
Oct. ..	3	..	Dec. ..	11	17
Nov. ..	3	..			
Dec. ..	3	..			
1942			1943		
Jan. ..	3	..	Jan. ..	7	200
Feb. ..	4	..	Feb. ..	14	163
Mar. ..	7	..	Mar. ..	13	178
Apr. ..	6	..	Apr. ..	12	106
May ..	3	..	May ..	14	18
June ..	6	..	June ..	8	6
July ..	9	..	July ..	10	1
Aug. ..	14	..	Aug. ..	5	..
Sept. ..	19	..	Sept. ..	6	..
	Total ..	.. ..		195	689

* The Lancet, Sept. 2 and 9. For references see Sept. 9, p. 344.

Thus out of 6 officers who had not been inoculated with icterogenic vaccine, 3 developed symptoms and signs of infective hepatitis. Since they were continually exposed in their own mess to the possibility of infection from cases of postinoculation jaundice, and as indeed this was the only human source of infection discovered, it is perhaps reasonable to suspect that this was the primary source of their infection. There was no association with pigs.

Second Example.—During the last six months of 1942, a second unit, composed wholly of Europeans and situated many miles from the first, had 6 cases of infective hepatitis which were spaced as follows :—

No. of case.	Date of reporting sick.	Probable incubation period if infected from a previous case.
1 ..	July 9, 1942 ..	—
2 ..	Aug. 3, 1942 ..	25 days
3 ..	Sept. 4, 1942 ..	32 ,,
4 ..	Sept. 9, 1942 ..	37 ,,
5 ..	Oct. 8, 1942 ..	29 or 34 ,,
6 ..	Oct. 10, 1942 ..	31 or 36 ,,

If the incubation period of infective hepatitis is taken as being from 20 to 40 days it will be seen that the fit is fairly accurate, cases 5 and 6 having been infected either by case 3 or 4. Such a series has been constructed in many epidemics of infective hepatitis. During the first six months of 1943 there were 8 cases of infective hepatitis in the same unit in men who had not received icterogenic yellow fever vaccine during the period when, or at the places where, this was being used. They had been immunised with non-icterogenic vaccine against yellow fever either in West Africa or in the Middle East at intervals of from 21 days to a year before the present outbreak. The date of reporting sick and the probable incubation period, if they had become infected from a previous case in the same unit, are as follows :

No. of case.	Date of reporting sick.	Probable incubation period if infected from a previous case.
7 ..	Jan. 8, 1943 ..	Not applicable
8 ..	Jan. 15, 1943 ..	7 or 97 days
9 ..	Jan. 26, 1943 ..	11 or 18 ,,
10 ..	March 10, 1943 ..	43 ,,
11 ..	March 22, 1943 ..	12 or 55 ,,
12 ..	March 24, 1943 ..	2, 14 or 57 ,,
13 ..	May 30, 1943 ..	67 ,,
14 ..	June 4, 1943 ..	5 or 72 ,,

It will be seen that it is not easy to place these cases in any sequence such as that observed in 1942. No case of infective hepatitis was known to have occurred during the last two months of 1942, and to connect the October cases with the first in 1943 would be to postulate an incubation period of 97 days from Oct. 10, 1942, to Jan. 15, 1943. This date is taken since case 7 must be excluded from the series because the patient joined the unit only a few days before reporting sick and well within the incubation of infective hepatitis. Beginning with case 8, therefore, the incubation periods are quite irregular. However, during the period under review no less than 64 cases of jaundice following yellow fever inoculation occurred in the unit. The first of these patients became sick on Dec. 18, 1942. Case 8 in the infective hepatitis series went sick on Jan. 15, 1943, an incubation period of 28 days if there was spread from the first case of postinoculation icterus to case 8.

After Dec. 18, 1942, further cases of postinoculation jaundice developed on Dec. 29, and 31 and thereafter from Jan. 6, 1943, there were 11 cases in the remaining 25 days of January, 8 in February, 7 in March and 4 in April.

The last case of postinoculation jaundice in this unit reported sick on May 13.

During the period when cases of postinoculation jaundice were developing frequently, numerous opportunities for close contact existed between those in the preicteric period and normal contacts. One example must suffice. F/Sgt. D. was inoculated against yellow fever on Dec. 12, 1942, and was admitted to hospital on May 13, 1943, with jaundice, having had a preicteric period of 7 days' duration : F/Sgt. G and Sgt. H were admitted on May 30 and June 4 with infective hepatitis. These two NCOs had been inoculated on June 18, 1942, nearly a year before, with yellow fever vaccine that was not icterogenic. The three NCOs were very close companions, being members of the same mess and the same squadron. F/Sgt. D and F/Sgt. G shared the same sleeping quarters, a small room in which there was space only for two beds.

These examples are surely suggestive that secondary contact spread may occur if that contact is sufficiently intimate. They offer a parallel to the evidence brought forward by Propert (1938) who believed that he had observed spread to contact children of the hepatitis induced by injections of measles immune serum. They are supported by experimental transmission through nasal washings (Findlay and Martin 1943), which is the experimental equivalent of very intimate contact. They do not explain the frequent observations in the MEF that among crews of tanks and lorries in the desert it was the exception rather than the rule for more than one member of the crew to contract infective hepatitis. It may well be that in the conditions of mobile warfare contact is not so intimate nor so suitable for spread as in static units housed in comparatively cramped quarters. Thus, though the men operating tanks are in contact and work in the same tank, they are actually subject to some degree of ventilation and at night or during rest-periods are in the open by the tanks : they are thus better spaced and protected than men who live in the humid heat of barrack rooms and sleeping quarters in the tropics. Even in semi-closed communities in England, the spread of infective hepatitis is often limited, for among 99 outbreaks in schools only 14 showed more than 2 victims (Med. Res. Council 1938).

IMMUNITY

Little is known of the degree of immunity acquired after infective hepatitis. Before attempting to determine whether infective hepatitis gives immunity against hepatitis following the injection of yellow fever vaccine, it is essential therefore to have data on the frequency of second attacks of infective hepatitis. A questionnaire was sent out to unselected units in four areas, asking for the numbers of officers and men who had had one or more attacks of jaundice in early life or who had been exposed to infective hepatitis either as a result of cases of jaundice in their homes or in their schools. Replies were received from 792 officers and 1822 men, a total of 2614 ; among these, 69 officers (8·7%) and 85 other ranks (4·7%) had suffered from jaundice either in childhood or in adolescence, and a further 115 (4·4%) officers and men had been exposed to the danger of infection but had not, so far as they knew, suffered from jaundice. Of the 154 who had had one attack of jaundice, 4 said they had had two attacks. One officer had had two attacks at an interval of 18 years, while 3 " other ranks " had suffered twice at intervals of 15, 12 and 5 years respectively. Full data are given in table VII. It is thus seen that the immunity produced by one attack of infective hepatitis is probably considerable but is not absolute since in 4 of 154 cases, or 2·6%, it broke down.

TABLE VII—INCIDENCE OF JAUNDICE IN CHILDHOOD AND ADOLESCENCE AMONG ADULT EUROPEAN MALES

Area	Total		History of jaundice		History of 2 attacks of jaundice		Exposed to jaundice infection	
	Officers	Other ranks	Officers	Other ranks	Officers	Other ranks	Officers	Other ranks
			%	%			%	%
1	200	411	16 (8·0)	10(2·4)	0	0	14(7·0)	20(4·9)
2	446	1099	36 (8·1)	36(5·1)	1	2	27(6·1)	37(3·4)
3	36	112	6(16·7)	1(0·9)	0	0	0	3(2·7)
4	110	200	11(10·0)	18(9·0)	0	1	8(7·3)	6(3·0)
Total	792	1822	69(8·7)	85(4·7)	1	3	49(6·2)	66(3·6)

If now the 90 officers and 599 men who suffered from hepatitis after yellow fever vaccine injections were a true random sample of the population, 7·8 officers and 28 men, on the basis of the expected percentages, should have given a history of a previous attack of jaundice. Actually only one officer (1·1%) and three men (0·5%) gave a history of a previous attack of jaundice : the officer had had infective hepatitis 23 years before and 3 " other ranks " had had jaundice 8, 5 and 3 years previously. Differences in percentage as great as this

might arise about 1 in 50 times among officers but considerably less than 1 in 10,000 times among other ranks. It is therefore suggested that the officers and men who suffered from hepatitis after injection of an icterogenic yellow fever vaccine were not a true random sample of the population but were selected because they had not previously acquired immunity to infective hepatitis. Since the immunity to infective hepatitis is not absolute, a few individuals would be expected to give a history of having both infective hepatitis and hepatitis following yellow fever inoculation; this expectation was fulfilled. The figures also illustrate the greater susceptibility of the officer class to infective hepatitis even in early life.

In order to test still further the immunological relationship between infective hepatitis and hepatitis following injection of yellow fever vaccine, 3 persons who had suffered from infective hepatitis received an intranasal instillation of a known icterogenic human serum; the same serum was injected subcutaneously (0·5 c.cm.) into 3 persons who had suffered from jaundice following injection of yellow fever vaccine, while 5 persons who had recovered from icterus due to the same cause received intranasal instillations. So far they have shown no sign of ill health. Their history will be given in detail elsewhere since at present it is only three months since they were inoculated. In view of the theory that those who develop postinoculation jaundice are allergic to certain human sera it is of interest that none of the 11 persons inoculated with the icterogenic serum showed any evidence of sensitivity. The icterogenic serum, for which our thanks are due to Dr. F. O. MacCallum, had been used in the preparation of icterogenic batches of yellow fever vaccine.

In view of the possible immunity induced by infective hepatitis against hepatitis caused by icterogenic sera it would have been of interest to have obtained the history of all persons who, although inoculated with known icterogenic serum, did not develop jaundice. As already mentioned this has not been possible, but 4 persons who were inoculated with a known icterogenic batch of yellow fever vaccine and did not develop jaundice are known to have had jaundice in childhood.

COMPLEMENT-FIXATION

In order to obtain further information on the causative agent of inoculation jaundice and its relation to other forms of hepatitis, an antigen was prepared from the liver of an African soldier who had died from an acute necrosis of the liver. The liver was removed within a few minutes of death. Using this liver as antigen we attempted to produce a complement-fixation reaction along the lines laid down by Bedson and Bland (1929) for certain virus infections.

The African soldier (Pte. AA) who provided the antigen was one of the two developing jaundice in unit A, in which, as previously described, there is reason to postulate a spread to contacts from patients suffering from hepatitis after yellow fever inoculation. As a preliminary group for test, sera were taken from 6 persons who had recently suffered from postinoculation jaundice; all these persons belonged to unit A. In addition, a sample was taken from one of the volunteers in whom we had effected successful passage of yellow fever inoculation jaundice by the intranasal route (Findlay and Martin 1943). As controls, 5 sera were taken at random from African patients in a West African general hospital; of these, K 4 had a strong positive Kahn reaction while K 57 was from a patient who had developed jaundice during a course of neoarsphenamine injections but whose Kahn reaction, at the time of sampling, was negative. As a further control on the test, liver removed from an African who had died of heat stroke was treated in a manner identical with that used in the preparation of the hepatitis liver antigen. All sera were put up against the hepatitis and the heat-stroke liver antigens. Five out of the 6 test sera from cases of yellow fever inoculation hepatitis were positive with the hepatitis antigen and all were negative with the heat-stroke antigen. One of the remaining hepatitis sera only just failed to show a positive fixation up to test level. In addition, the serum of the experimentally produced case was positive. The control sera were all negative with the exception of K 57 which was positive up to the test level.

A number of other complement-fixation tests have given positive results. Among these may be mentioned sera from patients convalescent from hepatitis occurring in England: for these our thanks are due to Dr. F. O. MacCallum. In addition, the following sera have given positive fixation:—

(1) A European (UHA) now in West Africa, who eight years ago at the age of thirteen had an attack of infective hepatitis of such severity as to necessitate his remaining in bed for six weeks.

(2) A European (VS) admitted to a military hospital in West Africa after yellow fever inoculation on Jan. 22, 1943, gave positive fixation seven months later with the same antigens and under precisely the same test conditions as the previous patient.

(3) A European officer (MM), who came into hospital with anorexia, general lassitude and a liver 2 in. below the right costal margin but no jaundice, gave a positive reaction. His symptoms were in no way associated with yellow fever inoculation while liver-function tests gave no evidence of liver insufficiency.

(4) Sera from 4 cases of postarsphenamine jaundice fixed complement in low titres.

(5) An African (AK) suffering from infective hepatitis did not show complement-fixing antibodies before the 24th day after the onset of jaundice. On or after the 28th day, when the patient was convalescent, a complement-fixation reaction was obtained.

(6) The serum of one man who suffered from hepatitis after injection of yellow fever vaccine in 1937 fixed complement, that of a second failed to fix complement.

In addition to the antigen prepared from the liver of Pte. A A, antigen extracts were prepared from 4 Africans dying with liver damage which resembled that found in infective hepatitis. Two only of these preparations were effective; neither approached the potency of the original preparation from Pte. A A. All preparations deteriorated after some weeks even though kept below 2° C. Sera from patients suffering from infective hepatitis which gave no fixation with one antigen, of which there were a number, gave negative reaction with all three. The cause of these failures may be that our antigens were relatively crude and weak. The complement-fixing antigen would appear to be separate from the icterogenic agent itself. Liver emulsion removed at death from a fatal case of infective hepatitis and serum taken immediately before death on inoculation into 4 volunteers failed to set up the disease but an antigen prepared from the liver fixed complement.

The findings, briefly recorded here, which will be the subject of a further communication, support the contention that the agents responsible for infective hepatitis, hepatitis following yellow fever inoculation and jaundice sometimes associated with the administration of neoarsphenamine belong to a single group and are antigenically related, though they do not prove that the agents are necessarily identical. Further, the finding of a positive fixation in the case of M is to some extent evidence that infective hepatitis may not necessarily be associated with frank jaundice, a conclusion which on clinical grounds is probable (cf. first section of this paper).

If, as the evidence here presented suggests, the causal agent of infective hepatitis were immunologically related to the agent responsible for the hepatitis associated with the injection of yellow fever vaccine an explanation would be forthcoming for the relative insusceptibility of children to the jaudice following yellow fever immunisation, as described by Fox and others (1942). Infective hepatitis, though it may attack older people, is primarily a disease of childhood. Unfortunately Fox and his colleagues give no information of an epidemic of infective hepatitis specifically attacking children in the areas in Brazil in which they were carrying out yellow fever immunisation with batches of icterogenic vaccine. That an epidemic of infective hepatitis was occurring in the two areas is, however, definite, for among 1072 cases of icterus in the areas under investigation, 70 were in persons who had not been vaccinated.

Up to the present, attempts to produce a precipitin "ring" reaction between sera from acute cases of infective hepatitis and from patients convalescent from either infective hepatitis or postinoculation jaundice have failed.

EXPERIMENTS IN TRANSMISSION TO ANIMALS

Numerous attempts have been made to transmit the disease to animals, using serum, whole blood or nasal washings in physiological saline by subcutaneous, intraperitoneal, intracerebral and intranasal routes. The animals employed were the baboon, *Papio anubis choras*; six species of monkeys, *Cercopithecus æthiops sabæus*, *C. mona lowei*, *C. nictitans petaurista*, *Colobus badius badius*, *Cercocebus torquatus* and *Erythrocebus patas*; Pruner's hedgehog, *Atelerix albiventris*; the horse; the ground-squirrel, *Euxerus erythropus erythropus*; the small dormouse, *Clariglis spurrelli*; the brush-tailed porcupine, *Atherura africana*; the giant rat, *Cricetomys gambianus*; the grass-cutter, *Thryonomys swinderianus*; and guineapigs, rats, mice and rabbits. No positive results were obtained.

One might criticise these experiments on the grounds that the icterogenic agent may leave the blood or alternatively be neutralised by immune bodies soon after the onset of jaundice, just as the virus of yellow fever is neutralised in the blood of man three days after the onset of fever. However, *Cercopithecus æthiops subæus*, *C. mona lowei*, *Cricetomys gambianus*, mice, rats and guineapigs were all inoculated with serum or nasal washings from patients in the preicteric period. In addition, *Cercopithecus mona lowei*, *Papio anubis choras*, mice, guineapigs, *Cricetomys gambianus* and rabbits have all been inoculated subcutaneously and intranasally with a known icterogenic serum without result.

A monkey, *C. æthiops sabæus*, and a baboon *P. anubis choras*, were given an injection of 1 c.cm. of carbon tetrachloride immediately before and a week after injection of serum from a patient with well-developed postinoculation jaundice, in order to try and damage the liver; no illness resulted. More recently, however, extensive liver necrosis was produced in a monkey, *C. nictitans petaurista*, which had been given a course of 6 weekly injections of neoarsphenamine and had received an injection of icterogenic serum. The monkey died 23 days after the injection of icterogenic serum with an icterus index of 17. Three injections of neoarsphenamine were given after the injection of the icterogenic serum. A control monkey which had received the same number of injections of neoarsphenamine was also killed and showed no liver necrosis. A liver emulsion of the necrosed liver was inoculated into another monkey which had received a series of neoarsphenamine injections and into a contact. This second prepared monkey, 28 days later appeared ill and its icterus index was 12, having risen from 4 ten days previously. This monkey also had necrosis of the liver though to a lesser degree than the first monkey.

The histological findings in these monkeys were similar to those seen in human cases of neoarsphenamine jaundice and in the fatal case of postinoculation hepatitis. These experiments are being actively continued. It is as yet too early to be certain whether successful transmission to monkeys has been attained.

Roholm and Iversen (1939), Mitchell (1943) and Dible and others (1943) have drawn attention to the similarity of the histological findings in postarsphenamine jaundice and infective hepatitis.

Attempts to produce specific lesions on the chorioallontoic membrane of the developing chick embryo have failed. We were thus unable to confirm the results claimed by Siede and Meding (1941) and Mancke and Siede (1942).

All these negative attempts at direct transmission have a parallel in our previous unsuccessful efforts to infect animals with the agent of infective hepatitis (Findlay, Dunlop and Brown 1931). Similar failures have been recorded by Van Rooyen and Gordon (1942), and Cameron and others (1943). In the case of infective hepatitis, claims have been made by Andersen (1937) and Andersen and Tulinius (1938) to have transmitted the disease to pigs. In a limited series of experiments Findlay and others (1939) failed to confirm these results. In Denmark, epidemics are believed to arise in human beings as the result of infection from pigs. It is not easy in countries such as England to find any parallelism between outbreaks of jaundice in pigs and men. In addition, infective hepatitis is endemic in Palestine and in strict Mohammedan towns such as Omdurman and El Obeid in the Anglo-Egyptian Sudan where for religious reasons the contact between man and pig is practically non-existent.

EXPERIMENTS IN TRANSMISSION TO MAN

In view of the difficulty in transmitting postinoculation jaundice to animals an attempt was made to test the possibility of passage to human volunteers. Certain difficulties are inherent in the use of human volunteers. In the first place some 5% of the population have already suffered from infective hepatitis. If there is any antigenic relationship, as our investigations suggest, between the causal agents of infective hepatitis and postinoculation jaundice this 5% of the population might be expected to have some degree of resistance to the experimental inoculation. A further 4% have been exposed to infection in youth and may have some immunity.

In addition, the community in which the volunteers are living must have been free from infective hepatitis for a considerable period before the experiments began and must be free from infection during the incubation period; the volunteers must not have been in contact with known cases of infective hepatitis. Such conditions are obviously not easy to fulfil, especially in war-time, but until they are fulfilled and an experiment is performed somewhat on the lines of that originally laid down by Laidlaw and Dunkin in the case of dog distemper, criticism can always be levelled at any results obtained.

Before detailing our own results with the transmission of postinoculation jaundice to man it may be worth while to mention the results of previous efforts to infect human beings with infective hepatitis.

Lainer (1940) attempted to infect first himself and later other volunteers by direct blood-transfusions, using 300 c.cm. volumes from 15 typical cases of "catarrhal jaundice." None of the subjects developed icterus. Volunteers were also fed on duodenal juice from the same patients. Van Rooyen and Gordon (1942) reported negative results in the case of a patient receiving a blood-transfusion from a donor who a few hours later developed infective hepatitis. It will be observed that in all these experiments large amounts of blood were injected into the volunteers.

Findlay, Dunlop and Brown (1931) recorded what was apparently the spontaneous infection of a laboratory worker with infective hepatitis. The patient had been handling sera from patients with infective hepatitis during an epidemic in Yorkshire. The incubation period of this case of "laboratory infection" could not have been less than 34 or more than 41 days. If spontaneous infection did occur the agent most probably gained entrance through the conjunctival sac or the nasopharynx. Later Voegt (1942) obtained positive results by feeding volunteers on duodenal juice and by injecting serum from patients in the preicteric stage of infective hepatitis; the shortest incubation period was 28 days.

More recently Cameron and his colleagues (1943) inoculated a number of volunteers; one could not be traced, but of the remainder, one developed jaundice after a month, one after two months and the other 4 within six months. Five other volunteers under full Service conditions were injected with serum from a case of infective hepatitis; all developed jaundice in from one to just under six months. There is some evidence that these men may have transmitted the disease to others in the unit. Although infective hepatitis was present in the area during the incubation period the high percentage of those who developed symptoms after experimental inoculation strongly suggests that these men contracted the disease not as a result of chance infection but as a result of their injection. It will be noted that the variation in the incubation period was very similar to that observed in jaundice following the injection of icterogenic yellow fever vaccine.

In the present efforts to transmit postinoculation jaundice, 22 volunteers were inoculated by various routes with material from patients with postinoculation jaundice. The history of 4 of these volunteers has already been given (Findlay and Martin 1943); these volunteers were inoculated intranasally with nasal washings from preicteric or very early icteric patients, all of whom were members of the unit whose history has been detailed in discussing the occurrence of cases of postinoculation hepatitis without jaundice.

The conditions under which the experimental inoculations here detailed were carried out were similar to those already reported. Five volunteers received whole blood intranasally from patients with icterus of three days' duration; 5 volunteers were injected subcutane-

ously with 2 c.cm. of whole blood in 1 c.cm. physiological saline from similar icteric patients; 2 received 1 c.cm. of a suspension of fæces in saline which had been treated with ether, the fæces, clay-coloured, being obtained from a patient on his fourth day of icterus. All these patients remained in good health during an observation period of six months. Two other volunteers were injected subcutaneously with 0·5 c.cm. of an equal amount of whole blood and physiological saline. The blood was obtained on the second day of icterus; 104 days later AJ complained of anorexia and epigastric discomfort and for two nights had a temperature of 99° F., no increase occurred in the icterus index and no bile or urobilinogen was found in the urine. KP complained of epigastric pain, headache and constipation 108 days after inoculation and his urine contained urobilinogen for 48 hours; the liver edge was just palpable below the right costal margin and there was considerable tenderness over the region of the gall-bladder; these symptoms lasted for a week.

No claim is made that AJ and KP were actually infected and on the whole the negative results of injecting blood and fæces from patients with well-marked icterus are in striking contrast to those obtained by the intranasal instillation of nasal washings from patients in the preicteric period. If any conclusion can be drawn from these negative experiments it is that the icterogenic agent has either disappeared from or has been neutralised in the blood shortly after the appearance of icterus. It may, perhaps, remain viable in the nasopharynx for longer than in the blood. It will be remembered that in infective hepatitis the period of infectivity is usually regarded as short.

DISCUSSION

The clinical and pathological evidence brought forward in the first section of this paper leaves no doubt that the present outbreak of jaundice among Europeans who had received injections of yellow fever vaccine is similar to those outbreaks previously recorded after the use of yellow fever vaccines prepared in London, New York and South America. The method of preparation of the yellow fever vaccine responsible for the present outbreak supports the conclusion, already arrived at, that the jaundice had nothing to do with the yellow fever virus but was due to something contained in the apparently normal human serum. The occurrence of a similar type of jaundice after the injection of serum, plasma and possibly in at least one case whole blood, implies that human blood sometimes contains an icterogenic agent. The question is, what is the nature of the icterogenic agent and how does it gain entrance to the blood?

The possibility that certain sera cause an allergic reaction in particular individuals has little to recommend it in view of the many months which may elapse between injection of the serum or plasma and the onset of jaundice. In addition, the experiments here recorded in which persons who had already suffered from jaundice after injection of yellow fever vaccine showed no symptoms on reinoculation with known icterogenic serum, hardly fits in with an allergic hypothesis.

On the other hand, there is both direct and indirect evidence that the icterogenic agent of postinoculation jaundice behaves in many ways like a virus. No bacterium or other visible micro-organism has been cultured from the icterogenic serum or plasma; the icterogenic agent is known to be filtrable through Seitz filters and resists freezing and drying for long periods. It can increase in a medium known to be suitable for the growth of a virus and it resists comparatively strong concentrations of phenol. The icterogenic agent has not been transmitted to lower animals but can produce its effects in man after subcutaneous inoculation or intranasal instillation. The latent period after intranasal instillation is from 28 to 50 days; after subcutaneous inoculation 26 to 239 days or even longer. This variation in the latent period is by no means inconsistent with a virus causation, since many viruses show great variation in their incubation periods.

Now there exists a common disease, infective hepatitis, which is similar to the hepatitis which follows injection of icterogenic blood products. The clinical and pathological changes produced by the causal agent of infective hepatitis are indistinguishable from those caused by the icterogenic agent in the blood. The causal agent of infective hepatitis has not been transmitted to lower animals but is transmissible to man. Subcutaneous inoculation of serum from cases of infective hepatitis is followed by an incubation period of from 30 days to 6 months. Infective hepatitis is generally regarded as being transmitted as a droplet infection through the nasopharynx. The incubation period is from 20 to 40 days but it may be longer. There is some evidence that in a diabetes clinic infective hepatitis may possibly have been transmitted by contaminated syringes (Graham 1938).

Infective hepatitis is not a highly infectious disease and the numbers of contacts infected, particularly in the higher age-groups, is not great; spread occurs only in conditions of close contact. Postinoculation jaundice also is not highly infectious but there is suggestive evidence that contact infection may occur and in addition the icterogenic agent can be obtained from nasal washings. Infective hepatitis is by no means uncommon and some 5% of adult European males have had one attack. Since second attacks are rare it is probable that a considerable degree of immunity is conferred. Among the 689 persons in whom icterus appeared after yellow fever inoculation only 4 gave a history of a previous attack of infective hepatitis. This suggests that those who suffered from postinoculation jaundice were selected because they did not possess an immunity due to a previous attack of infective hepatitis. An antigen made from the livers of patients dying with infective hepatitis fixes complement with the sera of patients who have recovered from infective hepatitis and from postinoculation jaundice.

Infective hepatitis can occur, as can postinoculation jaundice, in a forme frustre without recognisable jaundice.

We suggest that the agents causing postinoculation jaundice and infective hepatitis are either identical or very closely related. Postinoculation jaundice would thus be due to the use of serum, plasma or whole blood from a patient with a virus of the infective hepatitis group in his blood. The virus might be present because the patient was incubating, or was suffering from, infective hepatitis.

Another possibility is that the virus of infective hepatitis appears occasionally in the blood of an immune person. In many virus infections immunity is dependent on the continued presence of virus in the tissues; small amounts of virus are, it is supposed, liberated from time to time and stimulate the formation of fresh amounts of antibody. This theory, which is now being tested experimentally in the case of infective hepatitis, would explain the fact that evidence is usually not forthcoming that donors of icterogenic serum are suffering from infective hepatitis; it would also explain the curious finding that very small injections of serum or plasma are as liable or even more liable than large transfusions to cause icterus. In virus infections it is now well known that a mixture of virus and immune serum may be harmless if injected in large amounts but virulent if given in very small amounts (cf. Findlay 1936).

Until more is known of the conditions which allow of the presence of an icterogenic agent in human blood it would be wise to discard as donors of blood, serum or plasma all those who, at any time in their lives, have suffered from infective hepatitis.

In the preparation of yellow fever vaccine the use of serum of any sort has now been abandoned; anxiety that there will be still further outbreaks of jaundice after yellow fever immunisation can thus be allayed (Hargett, Burruss and Donovan 1943).

The evidence is thus growing that the agents responsible for infective hepatitis and the hepatitis that follows inoculation of icterogenic yellow fever vaccine behave in a very similar manner and are antigenically related. Until our knowledge has further advanced it would be idle to speculate whether these two agents are identical or merely members of a group of icterogenic agents one member of which is responsible for the production of infective hepatitis, a second for the hepatitis that is sometimes found in man after the injection of homologous blood or its products, and a third, perhaps, for the jaundice in horses that follows the injection of homologous serum. It is, however, not unwise to remember William of Occam's razor—"Entia non multiplicanda præter necessitatem."

SUMMARY

Possible examples of spread of postinoculation jaundice to contacts who had not been inoculated with icterogenic yellow fever vaccine are reported.

The incidence of infective hepatitis in childhood and adolescence in a sample of British troops has been ascertained. From this, evidence has been deduced that a previous attack of infective hepatitis gives a certain measure of protection against an attack of postinoculation jaundice, though the protection is not absolute.

A complement-fixation test has been developed, the results of which tend to show that there is an antigenic relationship between the agents responsible for infective hepatitis and postinoculation jaundice.

Efforts to transmit postinoculation jaundice to man and various animals are described.

A comparison is made of infective hepatitis and postinoculation jaundice; the conclusion is reached that they are due to the same or to very closely allied agents.

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LABORATORY AND CLINICAL TRIALS OF PATULIN

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A SUPPLY of patulin was made available to the Army in March, 1943, by the courtesy of Prof. H. Raistrick, for laboratory and clinical trials. These trials, which were sponsored by the Director of Pathology and the Consulting Physician, War Office, were begun in March, 1943, and continued until October, 1943. The results were briefly referred to in a letter to THE LANCET (1943, ii, 684). Since it is understood that the good results recorded by Hopkins [1] have not been confirmed by other workers, it has been thought desirable to record the results of the Army investigations. This article is a condensed version of the report submitted to the Director of Pathology.

BACTERIOSTATIC ACTIVITY

Patulin was found to have a bacteriostatic action on a wide range of bacteria, both gram-positive and gram-negative. Eighteen strains, members of the genera *Staphylococcus*, *Streptococcus*, *Corynebacterium*, *Neisseria*, *Bacterium* and *Hæmophilus* were tested and all were inhibited for 24 hours at 37° C. in fluid media by concentrations of patulin ranging from 1/40,000 to 1/160,000 for different strains. With one exception, *Bact. typhosum* Rawlings "rejuvenated," the addition of 10% horse serum reduced the activity of patulin by about three-quarters, while the overnight incubation of dilutions prepared in tryptic digest broth at pH 7·4 almost completely destroyed its activity.

TOXICITY TO ANIMALS

(*a*) *Mice.*—The toxicity for mice was ascertained by inoculating groups of mice intravenously, intraperitoneally and subcutaneously with graded doses. The mice were all of the Swiss strain, and weighed 16–19 grammes. All doses were given in 0·25 c.cm. saline.

Intravenous route.—Mice which received 1·0 mg. showed immediate excitement and jerky movements. Thirty seconds later they lay on their sides, became unconscious and stopped breathing. After a few minutes respiration restarted and within 5 minutes all the mice got up, but looked ill and remained so. They all died within 5 hours. Those mice given 0·5 mg. looked a little rough after one hour; one died after 5 hours and the remainder within 3 days. Mice given 0·25, 0·125 and 0·0625 mg. appeared well after one hour, but rough after 5 hours, though all survived. Mice which died showed plum-coloured lungs with a hæmorrhagic exudate and one had an axillary hæmorrhage in addition. Their livers appeared to be unusually pale.

Intraperitoneal route.—Mice given 1·0 mg. looked sick after 1 hour, and those given 0·5 mg. looked somewhat rough, while the others looked well. After 5 hours those given the smaller doses all looked rough, while those given 1·0 and 0·5 mg. were all dead. All the mice which died showed considerable ascites; in one the fluid was bloodstained. Mice given 0·25 mg. all died in 3 or 4 days.

Subcutaneous route.—All mice given subcutaneous injection appeared rough after 1 hour, and those which received 0·0625 mg. and 0·125 mg. were scratching the site of inoculation. After 5 hours all had developed œdema at the site of injection, which was very massive, forming tumours as large as the head of the mouse in those given 0·5 and 1·0 mg. All the latter died within 18 hours, and those given 0·25 mg. within 2 days.

It thus appeared that patulin was more toxic when given subcutaneously or intraperitoneally than by the intravenous route.

(*b*) *Rabbits.*—The effect of patulin on the rabbit's eye and skin was ascertained as a guide to the possible use of the substance in infections of the conjunctiva or skin in man. 1% patulin in pH 6·0 phosphate buffer dropped into the eye produced intense, apparently painless, œdema of the conjunctiva in each of two rabbits. Purulent conjunctivitis and opacity of the cornea developed, but there was ultimate complete recovery. The opposite eye of each rabbit received the phosphate buffer without effect. 0·1% patulin produced slight reddening of the conjunctiva without œdema, while weaker solutions had no effect.

Intradermal injections of 0·1 c.cm. of 1/1000, 1/10,000 and 1/20,000 patulin solutions produced a small swelling of the skin without reddening, and this swelling persisted during the next 24 hours. Corresponding solutions of buffer without the patulin were absorbed without giving rise to any swelling.

(*c*) *Chick embryos.*—A small number of 12-day developing chick embryos were inoculated with patulin solution via the allantoic sac. 0·25 c.cm. of 1/400, 1/800 and 1/1600 solutions of patulin all killed the embryos in 1–4 days, whereas embryos receiving weaker solutions survived. 0·5 c.cm. of 1/400 and 1/800 solutions of patulin dropped on the chorio-allantoic membrane of 12-day embryos produced no immediate vascular response, but resulted in the death of the embryos within 24 hours.

CHEMOTHERAPEUTIC EXPERIMENTS

Two chemotherapeutic experiments were made on mice, employing influenza virus A and *Bact. typhosum* respectively. Influenza virus was then thought to be a suitable test for patulin in view of the use of the drug in the treatment of the common cold, and *Bact. typhosum* was chosen for the bacterial infection because of the high in-vitro bacteriostasis of patulin for that organism.

(*a*) *Influenza virus A.*—Groups of six mice of 12–14 g. were treated by inoculation intraperitoneally of either phosphate buffer solution alone, or similar solution containing patulin. Treatment was given 1 day before, immediately after, 1 day after, and 2 days after the intranasal inoculation of a mouse-lung emulsion from mice infected with influenza A (PR 8 strain). The treated mice received 0·1875 mg. patulin in all. The virus inoculum was given in three dilutions of the original lung emulsion and the several dilutions were each administered to a group of patulin-treated and a group of control buffer-solution-treated mice. The mice were killed on the 10th day.

The treated and the control groups of mice showed a considerable similarity in number and extent of lesions, and the patulin treatment did not appear to have exerted any influence on the virus infection.

(*b*) *Bact. typhosum* ("rejuvenated" Rawlings strain).—This strain was chosen as it was inhibited by a dilution of 1/160,000 of patulin in broth cultures, even when 10% horse serum was added. Groups of mice were treated with buffer or with patulin solution intraperitoneally 24 hours before, 2 and 10½ hours after infection with measured quantities of an 18-hour culture of *Bact. typhosum* also given intraperitoneally. The treated mice each received 0·156 mg. patulin in all.

The treated mice had a higher death-rate during the 48 hours after injection than did the controls.

1. Hopkins, W. A. *Lancet*, 1943, ii, 631.

Treatment of the Common Cold

ORGANISATION OF CLINICAL TRIALS

During March, 1943, preliminary experiments were carried out at a primary training wing for infantry to ascertain whether patulin had any demonstrable effect on the severity or duration of the ordinary afebrile coryza or common cold. The investigator was supplied with two solutions, A and B, but he was not told which solution contained the active compound. Nearly 50 patients with coryza were treated with the solutions by nasal instillation of drops of the solutions, alternate cases being treated with the two solutions. It was found difficult to assess the effect of treatment, in view of the lack of real objective signs which could serve as a check to the patient's subjective feelings. Among both treated and controls some colds showed some improvement but this varied a good deal. Improvement coming on in 2 days and lasting for a week after the start of treatment might be classed as "cure." On this basis, "cures" were recorded among 5 of the 25 patients treated with patulin and in none of the 25 controls. Therefore although only one-fifth could be regarded as "cures" we felt that further trials were indicated.

The later trials were undertaken at a different primary training wing in August and September, 1943. The investigator was given solutions labelled C and D, F and G. One of each pair of solutions contained patulin. The procedure was that the technician allotted alternate patients for treatment with each solution and handed the appropriate solution to the clinician. Neither patient nor clinician knew at the time of treatment, or when the results were being recorded, whether patulin or control solution had been used. The technique of administration was changed to nasal spraying in order to conform to that used by Surgeon-Commander Hopkins. The solutions used were supplied from a military laboratory, and were prepared from a single sample of patulin, sent by Professor Raistrick, who had stated that the stability of the compound in solution was largely controlled by pH and that the substance should be dissolved in phosphate buffer at pH 6·0. He also stated that in his view the exact composition of the buffer was not of importance, and a mixed disodium phosphate and monosodium phosphate was therefore used throughout the work.

PREPARATION OF SOLUTIONS

During the preliminary trials with solutions A and B a stock solution of 1/1000 patulin in M/50 phosphate buffered sterile distilled water of pH 6·0 was supplied to the clinician who diluted it 1/10 with sterile normal saline on the day of use. The control solution consisted of the same buffered water without patulin, diluted freshly in saline.

On August 5, 1943, four bottles were sent to the clinician. Two consisted of 250 c.cm. volumes and were labelled "solution C" and "solution D," and also "ready for use." Solution C was a 1/5000 solution of patulin in M/500 sodium phosphate buffer, pH 6·0 in normal saline made from dry powder on August 5. D was buffered saline only. Two other bottles consisted of 25 c.cm. amounts labelled "concentrated 10 times." C contained 1/500 patulin in M/50 sodium phosphate buffer pH 6·0 in normal saline prepared from dry powder on August 5, while D was buffered saline only.

The clinician used the "ready for use" or dilute patulin and buffer solutions for 2 weeks after receipt, there having been a period of 2 days while the bottles were in the post. Thus the dilute solutions were used between August 7 and 21. The clinician then diluted the concentrated solutions to 250 c.cm. with sterile normal saline and used these until they were exhausted about August 29.

On August 27 six bottles of concentrated solutions were sent to the clinician, labelled F and G, three of patulin and three of buffered saline. The clinician then diluted each solution to 250 c.cm. as required for use. The concentrated patulin solution had been made up freshly from powder on August 27.

On Sept. 20 six further similar bottles of 25 c.cm. freshly prepared concentrated solutions were sent, three of patulin and three of control solution. These were diluted as required, and used up to Oct. 6 when the experiment terminated. That this technique did not impair the activity of the patulin was shown by the following test, carried out on Nov. 24, 1943. The first solution diluted by the clinician from the batch prepared on Sept. 20 had not been exhausted, and two bottles of the concentrated solutions remained. These were compared with a stock 1/1000 patulin solution in M/400 phosphate buffer solution prepared on March 11, 1943, and with one freshly prepared on Nov. 24, the day of the test. All four solutions inhibited the growth of *Staph. aureus* and of *Bact. typhosum* (Watson) to within the limits of error, taken as half a tube reading, of a final concentration of 1/80,000 patulin.

This has been set out at some length, for early criticism of the Army investigations was mainly directed at the minutiæ of the preparation of solutions.

CLINICAL PROCEDURE

First day.—Cases were first seen at 09.00 hours. A detailed history was then taken and recorded on a special form. Temperature and pulse-rate were noted, and an examination of the conjunctivæ, nose (with speculum), nasal sinuses for tenderness on pressure, fauces and chest was then made. The amount of nasal discharge and obstruction were next assessed. Two smears of the nasal discharge were made, and a swab taken for culture. The patient was then told to lie on a couch, where he was sprayed (using a de Vilbiss spray) up both nostrils and into the throat, and a few drops of the solution used were also instilled into each nostril with a pipette. About 3–5 c.cm. of either patulin or control solution were thus given. The patient was instructed not to blow his nose for half an hour, but simply to dab his nostrils with a handkerchief if required. He was instructed to report again at 12.00 hours, 14.00 hours and 16.00 hours, and again the next day. On each occasion the amount of nasal obstruction and discharge were assessed and recorded, and then the treatment was repeated.

Third day.—No treatment was given, but further smears of the nasal discharge were made, and in some cases a further swab for culture. He was also given a form on which to record the daily progress of his cold until his final attendance on the 7th day. On the 7th day his answer to the question "Do you think the treatment has done your cold any good?" was recorded, and if the cold was still present, he was handed a slip on which to record the day on which he considered his cold ended.

SPECIAL INVESTIGATIONS

Two smears of the nasal discharge were taken on the 1st day of attendance and again on the 3rd day. One of each was stained by Gram's method and one with Leishman's stain. The bacteria and types of cells present were thus observed before and after treatment. A culture was made from a swab, on the 1st day only in most cases, though in a few cases it was also made on the 3rd day. If the history or the physical signs indicated that a chest lesion was possibly present, a skiagram of the chest was taken.

An attempt was made to correlate the findings in smears and cultures with the clinical progress of each case. It would be expected that those cases which were clinical successes would be found amongst those whose nasal discharge showed a definite decrease in pus or bacteria or both. This was not obviously the case. There was no correlation between the type of organism present in cultures and the clinical response or the appearances in films after treatment, and it could not be said that either solution acted on any special organism or failed because any special organism was present.

ANALYSIS OF CASES AND RESULTS

During the trial the investigator did not gain any impression that one solution was better than the other; so personal bias in assessing results was eliminated as far as possible. All the data were obtained before an analysis of the results was begun.

In all, 130 cases of coryza were investigated, alternate cases being controls. The first 19 cases were not adequately followed up and occurred only spasmodically during the summer. They were useful in getting the procedure running smoothly. They have been excluded from the analysis. Some of the remaining cases were unable to attend for the requisite number of times, owing to leave, postings and so forth. There remained for analysis 100 cases, 50 treated with patulin and 50 with the control buffer solution.

Type of cases.—The subjects were all men, with the exception of one ATS private. No officers were treated. The majority were young recruits for the armoured corps in their twenties, but the ages ranged from 17 to 43 years. The colds were of the acute type commonly seen in recruit establishments and conformed to the ordinary type of cold frequent in this country in the autumn. Only 3 were associated with pyrexia, which in no case exceeded 99·6° F. The symptoms, previous history, nasal signs and complications of the treated and the control groups were analysed, and the two groups were found to be closely comparable in these respects.

Effect of treatment.—The cases were classified into groups according to the clinical response. Group 1 contains all the obvious successes whose colds improved on all days, or which improved on the first 3 days and had gone by the 7th. Group 2 consists of those cases who, although they did not show improvement at the end of the 1st day—i.e., within 7 hours—had improved on the next two mornings and showed either continued improvement or absence of the cold on the 7th day. Group 3 consists of cases showing no improvement on the first two days, but improved continuously thereafter. Group 4 contains cases which showed some temporary improvement which was not maintained. Group 5 failed to show any improvement during the whole week. Of group 1, only 1 case, treated with the control solution, showed clinical cure within 48 hours (table I).

TABLE I

Group	Patulin		Control	
1. Improved on all days	5	9	7	14
2. Improved after the 1st day	1		4	
3. Improved after the 2nd day	3		3	
4. Temporary improvement, but relapsed	13		7	
Total cases considered improved	22		21	
Group 5. Cases not affected	28		29	
Totals	50		50	
Number of cases whose colds had gone on or before 7th day	7		10	

Duration of the colds.—When last seen on the 7th day, patients were given slips to fill in and return when their colds eventually went. Only those whose colds had gone by the end of the week after starting treatment were examined for the absence of signs of coryza. The patients' estimates of the duration of their colds were probably variable. The results of 42 treated cases and the 42 controls from whom the necessary figures were obtained are given in table II.

TABLE II

	Patulin	Control
Duration of the cold before treatment—		
Colds over a week old before treatment	0	4
Average duration of remainder before treatment	2·6 days	2·74 days
Duration of the cold after treatment—		
0 – 7 days	7	10
8 –14 ,,	12	11
15–21 ,,	11	11
Over 21 days	12	10
Totals	42	42
Total duration of the cold—		
1– 7 days	4	5
8–14 ,,	9	8
15–21 ,,	13	14
Over 21 days	16	15
Totals	42	42

Opinion of the patients treated.—Answers given on the 7th day to the question "Do you think the treatment has done your cold any good?" were probably to some extent unreliable, for the honesty of the replies was perhaps tempered by a kindly desire not to give offence to the investigator whom they regarded as the sponsor of a new treatment. Further, they were for the most part impressed by the tests done and the interest taken in them, in contrast to the usual attitude to colds in the medical inspection room. The figures are :—

	Patulin	Control
Undecided, or believed that the treatment had no effect	13	13
Believed that the treatment had had a good effect, temporary or lasting	36	37

(The answer of one patient treated with patulin was not recorded).

Treatment of Conjunctivitis

Nine cases of bilateral conjunctivitis were treated by Brigadier Sir Stewart Duke-Elder with patulin which was sent to him in the form of a 1/1000 solution in M/400 phosphate buffer. He was advised to use it in final concentrations of 1/10,000 or 1/20,000 diluted with saline. The bottle of 1/1000 stock solution was returned after the trials and found to be fully active against *Staph. aureus* and *Bact. typhosum*. The report, which is quoted with his permission, is as follows :—

(*a*) In each case one eye was treated with patulin, the other with saline; in case 4 only one eye was affected. In cases 1, 2, 3, 5, 6, 7, 8 no clinical difference was seen between the two eyes. In case 9 the eye on saline improved considerably.

(*b*) The only organism which disappeared was the streptococcus, case 4. (It was noted, however, that *Proteus vulgaris* appeared in the second culture.)

(*c*) Cases 1 and 2 had 1/20,000 patulin; cases 3 to 9 had 1/10,000. The latter produced some irritation.

Summary and Conclusions

Patulin is bacteriostatic against a wide range of gram-positive and gram-negative bacteria. Its bacteriostatic activity is materially reduced by preliminary incubation at 37° C. overnight of dilutions in broth at pH 7·4, or by the addition of horse serum. It is stable in solution at pH 6·0 for several months at room temperature.

Toxicity experiments in mice have shown a relatively small margin between concentrations which kill the animals and those which produce bacteriostasis in vitro. Lethal and toxic effects are more readily produced by subcutaneous or intraperitoneal inoculation than by intravenous injection. Two experiments in mice resulted in failure to cure infections with influenza virus A or with *Bact. typhosum*.

Controlled clinical trials in the treatment of the common cold with patulin have shown no advantage from the use of this substance as compared with the use of a control buffer solution without patulin, nor did patulin appear to be of value in the treatment of human cases of conjunctivitis.

These therapeutic trials emphasised the great difficulty of assessing the effect of treatment in view of the lack of real objective signs which, in the common cold, can serve as a check of the patient's subjective feelings. A serious attempt was made in the main trial of 100 cases to eliminate personal bias, both during treatment and in recording results. Neither investigator nor patient knew whether patulin or control solution had been used for treatment, and all results were obtained before any analysis was begun.

The main trial was carried out on 100 men at a recruit establishment during the season of autumn colds. Patulin was given to 50 and the control solution to 50. The treated and the control groups were comparable as regards age, symptomatology, duration of the cold before and after treatment, and the bacteriological findings. Neither the control nor the patulin solution appeared to produce any effects which could be described as either immediate or dramatic.

The actual solutions used in the final series of trials were tested for bacteriostatic power 9 weeks after preparation and after the conclusion of the trials. When compared with a freshly prepared solution it was found that they retained full activity.

It had to be concluded that patulin had no demonstrable effect on the course of this series of colds as compared with the natural evolution of the disease.

Coffee-beans, whether roasted or not, contain about 1·3% of caffeine. If 2 oz. of the ground beans are used to make a pint of coffee, a teacupful of the beverage will contain some gr. 1½ of caffeine—about the same as an equal quantity of tea. Café au lait usually contains about one part of coffee to one of milk, so that a breakfast-cup of this will not contain more caffeine than a teacupful of tea. The Ministry of Food is now drawing up standards for liquid essences, under which coffee essences must contain not less than 0·5% and coffee-chicory essences not less than 0·25% of caffeine derived from coffee. To contain this amount, coffee essences will have to be prepared from not less than 4 lb. and coffee-chicory essences from not less than 2 lb. of roasted coffee per gallon.

CLINICAL TRIAL OF PATULIN IN THE COMMON COLD

REPORT OF THE PATULIN CLINICAL TRIALS COMMITTEE, MEDICAL RESEARCH COUNCIL

IN November, 1943, a report was published of the chemical properties and clinical effects of a metabolic product of *Penicillium patulum* Bainier, called patulin.[1] It was shown in a clinical trial on the common cold in naval personnel that when 95 patients treated with patulin were compared with 85 controls, the advantage to the treated patients was such that it would usually be regarded as statistically significant. The results obtained were considered encouraging, but no definite claims were made.

The discovery of an effective treatment for the common cold being a matter of such great practical importance, it was clearly desirable that this suggestion be reinvestigated as soon as possible. This was rendered the more necessary because, shortly after the publication of the first report, a second and independent group of workers stated that they had been unable to demonstrate any effect of patulin on the common cold.[2] The Medical Research Council, therefore, undertook an extensive reinvestigation of the claims regarding patulin, and the results are here reported.

The ease with which the effects of a therapeutic agent on a particular illness can be determined is primarily dependent upon the precision with which that condition can be defined. Such definition of the common cold presents considerable difficulties. First, there is no reason to believe that the condition popularly called a "cold" is always, or even usually, due to the same agent either in sporadic cases or in different epidemics. If "colds" can be caused by a diversity of agents, then great differences in the effect of a particular remedy are to be expected between different epidemics and between individual cases. Second, the duration of colds is not constant but varies, not only between different epidemics but also between different patients in the same epidemic, making the assessment of treatment difficult. Third, the objective signs associated with the common cold are too variable to serve as criteria of its presence or progress; a cold manifests itself mainly by subjective symptoms and, in consequence, diagnosis rests mainly upon the statements of the untrained patient.

To meet the first difficulty the investigation must test large numbers of patients, must take place at several widely separated places, and must continue long enough to exclude the possibility that a single brief epidemic is being studied. To meet the second difficulty the investigation must, in addition to fulfilling the above conditions, include a satisfactory series of control cases. This can only be done by ensuring that alternate cases at each centre are given a spurious treatment which, to the recipient, is indistinguishable from the genuine treatment. To meet the third difficulty the symptoms of the common cold must be defined and their frequency analysed; and from this analysis a series of simple questions must be framed, the answers to which will establish with reasonable certainty whether the patient is suffering from the illness commonly accepted as a "cold." In this latter connexion we had the advantage of studying an unpublished report by Dr. M. L. Rosenheim, Dr. H. A. Burt and Miss Joan Wadge, FRCS, of a previous investigation into a treatment for the common cold. Besides establishing the unreliability of objective signs, both as diagnostic criteria and guides to the progress of the case, their report analysed the frequency of different symptoms. On the basis of their findings the questions on our record card (see figure) were constructed.

1. Patulin in the Common Cold: Introduction by H. Raistrick; Biochemistry and Chemistry, by J. H. Birkinshaw, S. E. Michael, A. Bracken, and H. Raistrick; Preliminary Trial in the Common Cold, by W. E. Gye; Biological Properties and Extended Trial in the Common Cold, by W. A. Hopkins; Statistical Note by M. Greenwood, *Lancet*, 1943, ii, 625.
2. C. H. Stuart-Harris, A. E. Francis, J. M. Stansfeld, *Ibid*, 1943, ii, 684.

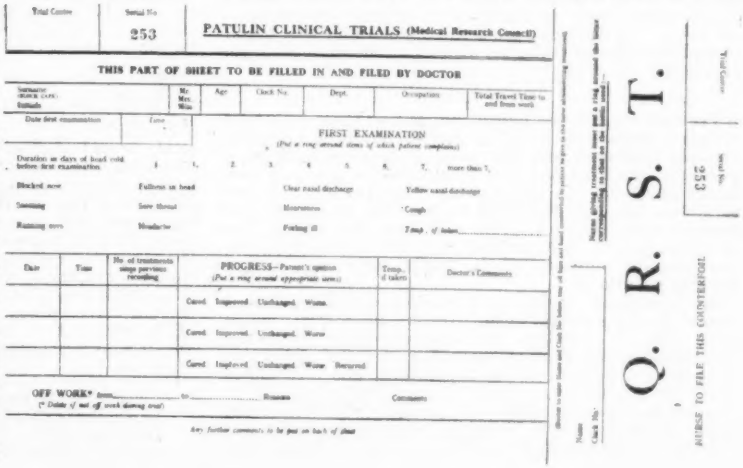
Investigation

Therapeutic trials have been carried out in 11 factories with a total population of approximately 90,000 and in three units of the Post Office with a population of approximately 15,000. These were widely distributed. In these trials the test solutions were instilled into the nostrils; but 2 additional trials were carried out, using a spray technique of administration, in 2 public schools with a population of approximately 800 to 1000. A pilot trial was carried out in a London factory in December, 1943, and early January, 1944. The main trials ran from Jan. 18 to April 11, 1944; although the trial in any particular unit did not continue throughout this period, trials in several were always in progress at any one time.

Selection of cases.—The trial at each place was supervised and organised locally by the medical officer in charge. All persons tested were volunteers. By means of notices and posters, broadcasts in the factory radio, meeting with works committees, and similar means, the existence of the test was brought to the notice of employees, and all with colds were asked to come to the medical department for treatment. Care was taken to ensure that volunteers were aware of the experimental nature of the trial and that they should honestly state whether or not the treatment had been effective. It was made clear that only cases of common colds were required and not cases of hay-fever, "chronic catarrh" or chronic bronchitis. If on any morning more volunteers attended than could be dealt with, then those with colds of shorter duration were asked to remain. Rarely had suitable cases to be refused save on the opening day or two of the trial when there was usually a rush of volunteers. Cases were accepted on the basis of the patient's described symptoms; clinical examinations were only made when there was reason to exclude some other condition.

Recording.—Patients were seen by the MO before receiving treatment from the factory nurse or sick-bay attendant. The MO remained ignorant which of the test solutions the patient received and neither the MO nor the nurse knew which contained patulin.

At the first attendance the MO filled in the record card and satisfied himself that the patient was in fact suffering from the common cold and not from some condition such as hay-fever or "chronic catarrh." He then detached the counterfoil and gave it to the patient who took it to the nurse in an adjoining room. The nurse gave out the test solutions in strict rotation, each patient receiving his own bottle of solution from which all treatments were given. The distinguishing letter of the particular solution given was ringed by the nurse



on the patient's counterfoil. The record sheet and counterfoil were filed separately by the MO and nurse respectively.

The patient returned to report progress to the MO at 24 hours, 48 hours and one week. At these attendances the MO ringed on the record card one of the words "cured," "improved," "unchanged," "worse," or "recurred," whichever accorded with the patient's statement of his condition.

TREATMENT

At the first attendance the technique of treatment was demonstrated to each patient by the nurse or attendant, who also gave the patient a leaflet of instruction. In all cases treatment was given during 48 hours and then stopped. In most cases the patient was given 3 treatments by the nurse in the surgery at 4-hourly intervals, on each of 2 consecutive days. He was instructed to carry out the treatment at the same intervals, and in exactly the same way at home, getting a friend or relative to help him. The number of treatments given at home naturally varied so that the total number received in the 48 hours ranged from 8 to 12. All treatments, whether at work or at home, were given from the same bottle of solution, which was in the patient's own charge.

In the published reports of the preliminary clinical trials of patulin, the solution was administered by spraying or in a few cases by sniffing up the nose. Neither of these methods seemed suitable for large-scale trials. Spraying requires special apparatus, impossible to supply in quantity during war-time, and in the hands of inexpert persons may be inefficient. Sniffing of solutions up the nose is potentially dangerous in that it may spread infection to adjoining sinuses. We had to find a simple, efficient and safe method which did not require special apparatus.

On the advice of Mr. T. E. Cawthorne, FRCS, we adapted the technique introduced by Proetz and called the "head-low position." The patient lies supine on a couch with the head hanging freely over the end. He breathes through his mouth and a teaspoonful of solution is run slowly into each nostril (a teaspoon was used because of the difficulty of supplying pipettes for patients to take home). The patient remains recumbent for about a minute, then sits up slowly and refrains from blowing his nose for an hour or so. Experiments to test the comparative efficiency of this method were carried out by Mr. Cawthorne. A solution of cocaine was introduced into the nostrils of a series of volunteers by four different methods—dropping, spraying, sniffing, and instillation in the head-low position. Then sensitivity of the olfactory nerves was tested by odiferous substances, that of the nasal mucous membrane by ammonia. Instillation in the head-low position alone produced complete anæsthesia and thus appeared to be easily the most efficient way of bringing fluid in contact with the whole nasal mucosa. This technique was therefore adopted for all trials save those in the two public schools. There sprays were available with skilled personnel to use them. In these two trials the opportunity was taken to reproduce exactly the conditions of the clinical trials previously reported.

DISPENSING

Previous experience had convinced us that, in a trial of this nature, it is of great importance that both the medical personnel and the patients be prevented from guessing which of the two treatments is genuine and which spurious. It had further been learnt that two solutions are not sufficient to prevent this. In this present trial, therefore, four solutions were used, two of which (R and T) contained patulin and two (Q and S) were simply solutions of the buffer salts used in dispensing patulin.

An important consideration was that patulin solutions should be reasonably fresh. In the pilot trial, which took place in London, the solutions were made up, dispatched to the factory that afternoon and given out next day. The strength of the patulin was 1/10,000 in a phosphate buffer as used by previous investigators. The control was a solution of phosphate buffer of the same strength. Any solution remaining over was collected when the daily delivery of new solutions was made. Solutions were therefore not more than 72 hours old at the time of the last treatment in the 48 hours. This method of dispensing, however, was clearly impracticable for the main trials in units widely distributed over the country. For these both patulin and buffer were dispensed in the solid state.

Cases of eight ampoules were prepared. Ampoules R_1 and T_1 contained 0·2 g. of patulin: ampoules R_2 and T_2 1·0 g. of citrate buffer. Ampoules Q_1 and S_1 contained 0·2 g. of citrate buffer, and ampoules Q_2 and S_2 0·8 g. of the same buffer. These were made into solution daily by dissolving the contents of each pair of ampoules (e.g., T_1 and T_2) in one litre of cold distilled water. The strength of these patulin solutions was thus 1/5000 in a 0·1% solution of buffer; the control solution was 0·1% buffer solution. These solutions were put up in 10 oz. bottles, each of which carried directions for use and the appropriate distinguishing letter on a tie-on label of a distinctive colour. On handing one of these bottles to the patient the coloured tie-on label was torn off and put in a box. Thus, by counting the labels in the box at any one time, the nurse dispensing treatment could check whether the four solutions, Q, R, S, and T, were in fact being given out in strict rotation. Any unused bottles remaining at the end of the day were discarded.

The solutions were consequently not more than 60 hours old at the time of the last treatment in the 48-hour period. The solution was not used by the patient as dispensed: he was instructed to add to each dose an equal quantity of warm water immediately before using. The strengths of the solution actually instilled were, therefore: patulin, 1/10,000 in a 0·05% solution of buffer; control, 0·05% buffer solution.

The buffer was devised to give a pH of 6·0 in distilled water. It consisted of approximately 15·5 parts of sodium citrate and 0·5 part of citric acid (the exact proportions must be determined by trial owing to slight variations in pH of sodium citrate) thoroughly ground together and subsequently passed through a fine sieve.[3] In the main trials and the latter part of the pilot trial, citrate buffer was used in preference to phosphate buffer because it was found that the latter could not easily be worked on the machines for dispensing powders into ampoules. Bacteriostatic, colorimetric and absorption-spectrograph tests showed that citrate buffer preserved the stability of patulin in the dilution used for, at least, the time required. Further, patulin has been recovered quantitatively from such solutions.

Results

In the various units 1449 patients were treated, but 101 record forms were rejected for reasons such as doubtful diagnosis, refusal to carry out treatment and absence from work. Thus 1348 were available for analysis and of these 668 were treated with patulin and 680 with the control solution. The results from each unit have been analysed separately so as to reveal any differences due to time and place. As, however, no significant differences were found, only the combined results for all units need be given here. Table I shows the percentage of cases *cured* and *cured and improved* at the 24 hours, the 48 hours and 1 week recordings. Table II shows the percentage of cases cured and improved at the three recordings, first for patients whose colds were of less than 3 days' duration before treatment was given, and second for those whose colds were of 3 days' or more duration.

TABLE I—ANALYSIS OF 668 CASES TREATED WITH PATULIN AND 680 CASES TREATED WITH THE CONTROL SOLUTION

Treatment	% cured at—			% cured or improved at—		
	24 hrs.	48 hrs.	1 week	24 hrs.	48 hrs.	1 week
Patulin	1·6	13	33	59	73	63
Control	1·2	13	37	64	77	69
Difference	0·4	0 ± 1·9	−4 ±2·8	−5 ±2·7	−4 ±2·5	−6 ±2·8*

3. In practice it was found that the pH of different samples of the buffer varied between 5·8 and 6·8, with a preponderance of samples having a pH of 6·0. This variation however does not affect the validity of the results since it has been shown that patulin is sufficiently stable in a citrate buffer of 6·8.

TABLE II

Treatment	Duration of cold before treatment—					
	less than 3 days			3 days or more		
	% cured or improved at—					
	24 hrs.	48 hrs.	1 week	24 hrs.	48 hrs.	1 week
Patulin	57	71	64	63	76	61
Control	59	74	67	71	81	73
Difference	−2 ±3·5	−3 ±3·2	−3 ±3·5	−8 ±4·2	−5 ±3·8	−12 ± 4·4*

* Statistically significant differences.

Note.—The criterion of "cured" and "improved" was the patient's own opinion.

It will be seen that the success of the treatment was very similar whether patulin or control was given. Probably the most useful result is that obtained at 48 hours. At this time the percentage "cured" was 13% both among controls and patulin-treated, while the percentage of "cured" and "improved" together was 73% for patulin-treated and 77% for those given the control solution.

On statistical analysis only two differences are significant. Both show a slightly higher percentage of cures, or improvement, with the control solution and both occur at the 1 week recording. In view of the fact that no significant differences were found at the 24, and 48 hour recordings, nor at 1 week in the patients with recent colds, it is felt that these differences at 1 week are irrelevant.

Similarly, in the two public-school units where the spray technique was used no significant differences in effects were found between the control and the patulin solution. In these two trials, however, only 49 cases were available for analysis.

Summary

In a large clinical trial of patulin in widely distributed areas in Great Britain and lasting from the beginning of December, 1943, to the middle of April, 1944, no evidence was found that patulin is effective in the treatment of the common cold.

The Patulin Clinical Trials Committee had the following membership: Prof. H. P. Himsworth (chairman), Dr. A. J. Amor, Dr. C. H. Andrewes, FRS, Mr. T. E. Cawthorne, Prof. M. Greenwood, FRS, Dr. B. M. Merriman, Dr. H. J. Parish, Prof. H. Raistrick, FRS, Dr. W. L. Scott and Dr. P. D'Arcy Hart (secretary). Dr. Joan Faulkner was appointed assistant secretary and supervised the actual trials.

The committee is indebted to Dr. W. J. Martin for help in the statistical analysis of the results, to the Therapeutic Research Corporation for providing and dispensing the agents to be tested, and to the management, medical staffs and workers in the several factories where trials were carried out for their ready coöperation and assistance.

Trials were carried out in the following establishments and schools:—

	Medical officer in charge
Ministry of Supply ROF's—	
A	Dr. H. P. Warren
B	Dr. H. M. Coulthard
C	Dr. B. Levin
D	Dr. F. Sargent
Post Office	Dr. M. Kennard Dr. I. Dixon Dr. J. W. Parks
Rolls-Royce, Ltd. at—	
Y	Dr. E. Collier
Z	Dr. N. L. Lloyd
Chloride Electrical Storage Co., Ltd.	Dr. R. E. Lane
Guest, Keen and Nettlefolds, Ltd.	Dr. W. Jeaffreson Lloyd
Vickers-Armstrongs Ltd.	Dr. A. Kerr Clarkson
Enfield Rolling Mills & Cable Works Ltd.	Dr. W. G. S. Pepper
Briggs Motor Bodies, Ltd.	Dr. H. F. Chard
Haileybury College	Dr. C. M. Billington
Rugby School	Dr. R. E. Smith

A STUDY OF TREASON: CORRIGENDUM.—The penultimate sentence in Major A. M. Meerloo's article in our issue of Sept. 2 (p. 321) should read: "Such hatred can be exorcised only by allowing each man freedom to criticise and by creating in him a sense of responsibility for his views." The word *exorcised* was wrongly given.

SIMPLE METHOD OF AMPUTATING THE THIGH

C. W. GORDON BRYAN, MC, FRCS
LIEUT.-COL. RAMC; SURGEON, ST. MARY'S HOSPITAL, LONDON

FOR about thirty years I have used on a large number of cases the following simple method of amputating the thigh.

With a long amputation knife the curved anterior incision is made as for a Carden from condyle to condyle passing halfway between the lower border of the patella and the tuberosity of the tibia. This cut is carried on superficial to the patella and deepened obliquely down to the front of the femur, dividing the periosteum. The posterior incision is then made practically transversely down to the back of the femur, which is reached at a higher level than the skin cut. The linea aspera is freed with scissors and the periosteum pushed up until the femur is bared about 11 inches below the great trochanter. With the aid of a shield retractor the bone is sawn through. The only vessels that usually need ligature are the main vessels, the long saphenous vein, the comes nervi ischiatici and an artery in the substance of the sartorius. A fish-tail division of the sciatic nerve high up inside its sheath is made and the long saphenous nerve cut short. A trident of corrugated rubber is inserted to drain behind and each side of the femur. If any sutures are used it is sufficient to insert two lateral and two terminal ones, but without them the anterior flap falls naturally into perfect position and is retained there by the dressing.

The whole operation takes usually 4–6 minutes but can be done more rapidly; I have completed it in 45 seconds. The advantages of this method are—(1) speed and avoidance of shock; (2) a minimum of muscle is divided, so preventing the plasma loss that is a well-marked feature of many thigh amputations, especially in the presence of inflammation; (3) the small amount of hæmorrhage and the small number of vessels for ligature.

The femur can be divided two inches below the site of election when it is considered wiser to minimise the dissection in anticipation of re-amputation later, but this procedure has in practice rarely been indicated. There is no disadvantage in leaving a theoretical excess of muscle in the stump, because the knee muscles waste with great rapidity. This is recognised in disabilities of the knee-joint, but is perhaps not fully appreciated in thigh amputations; it is usual to cut muscle away to an unnecessary extent.

Even without suture healing and consolidation of the stump is rapid. One officer on whom I did this amputation without sutures for a compound fracture involving the knee-joint, which was full of pus, was fitted with an artificial limb and walked to church to be married 7 weeks after the operation.

SUMMARY

An amputation of the thigh at the site of election is described, using a Carden incision to minimise shock, plasma loss and muscle retraction.

CONGENITAL MALARIA IN ENGLAND

R. P. GAMMIE, MD ABERD, DRCOG
PHYSICIAN TO BISHOP'S STORTFORD HOSPITAL

THE annotation on congenital malaria in THE LANCET of Jan. 29, 1944 (p. 156), prompts me to record a further case which occurred in my practice in 1939–40.

A woman with one child returned to England from India in August, 1939, and was seen when 26 weeks pregnant and found to be healthy. She had had an attack of malaria without identification of the type in 1938. In September, 1939, she developed a tape-worm infection. Early in October, 1939, she developed a temperature after a slight rigor and this was repeated in 48 hours after a severe rigor. Blood examination revealed parasites suggestive of a benign tertian infection. Treatment was instituted with mepacrine and her condition remained satisfactory until three days before the onset of labour (Dec. 1, 1939) when she "felt malarial." On the day of the actual confinement—which was uneventful—she had a rigor and ran a temperature of 103° F. The infant weighed 7 lb. and although rather flabby and thin was active and seemingly healthy. Breast-feeding was possible for only

14 days. On Jan. 3, 1940, the infant became very unwell and ran a temperature. Examination of the blood on Jan. 8 revealed severe anæmia and the presence of *Plasmodium vivax*. The spleen reached to the level of the iliac crest. Quinine sulphate in gr. ½ doses twice daily was administered for 2–3 days, then increasing to gr. ½ four times daily until the end of the week, ferri et ammonii citras being given at the same time. 'Lacquin' (Cow and Gate) was then given for 3 weeks; a teaspoonful, which contains quinine gr. 2½, was given in 8 oz. of water daily. On June 10 the weight was 13 lb., the anæmia had disappeared, and the spleen was just palpable beneath the costal margin. Further progress to date has been entirely satisfactory, and I examined the very healthy child, now aged 4 years, recently without finding any evidence or history of ill health.

The time of the year at which this child was born corresponds with the case reported by Tanner and Hewlett [1] in 1935, and the winter 1939–40 was an extreme one when the possibility of a malarial infection could be ruled out in this country.

The report of Jones and Brown [2] and the work of Wickramasuriya [3] lends further proof of the occurrence of true congenital malaria of transplacental origin, and in women returning to this country from malarial districts the condition should be borne in mind. The nature and the outcome of the treatment in this case suggests a favourable prognosis as regards the infant.

1. Tanner, N. C. and Hewlett, R. F. L. *Lancet*, 1935, ii, 369.
2. Jones, J. L. and Brown, H. C. *Ibid*, 1924, ii, 1058.
3. Wickramasuriya, G. A. W. *J. Obstet. Gynæc.* 1935, **42**, 816.

Reviews of Books

Johns Hopkins

Hospital and University School of Medicine. Vol. I. ALAN M. CHESNEY, MD, associate professor of medicine and dean of the medical faculty of the school. (Oxfd Univ. Press. Pp. 312. 18*s.* 6*d.*)

THE Johns Hopkins foundation has gained its present reputation as a centre of teaching and research in little more than half a century—a remarkable achievement. Dr. Chesney has placed on record the successive stages by which this was accomplished by a notable group of men and women. The volume covers the time from the incorporation of the hospital and university in 1867 to the opening of the medical school in 1893. The long period of planning, sometimes accompanied by delay and frustration from lack of funds, and the parts played by men such as J. S. Billings and Daniel Gilman are described with an enthusiasm which reflects the feeling of the time. The section on the opening and the first years of the hospital, with its side-lights on the personality of Osler in the early years of his fame, will appeal to British readers. The final chapters are mainly concerned with the successful launching of the medical school through the munificence of Miss Garrett and other ladies of Baltimore.

The Case against Pasteurization of Milk

JOHN P. BIBBY. (Staples. Pp. 71. 1*s.*)

AT the present time tuberculosis is an infectious disease conveyed for the most part by contact with infected human beings or by drinking infected cow's milk. How to avoid human transference is one of the most complicated problems that social medicine has to face, but infection by milk could be abolished overnight if effective pasteurisation became general. This would have been done long ago were it not for the widespread belief that repeated small doses of tubercle bacilli are a safeguard against disease and death—and there was a time when the bovine strain could be plausibly regarded as a mild and reasonable prophylactic. Today, however, few contend that children should be fortuitously fed with living bovine germs.

Mr. Bibby argues that the soundest and most economical way of reducing milk-borne infection is by encouraging the production of clean milk bottled on the farm. Everyone is in favour of up-to-date dairy farming, but Mr. Bibby seems unaware that the 1936 outbreak of typhoid at Bournemouth and Poole, and the 1929 epidemic of septic sore throat at Brighton and Hove, were both associated with cleanly produced and distributed raw milk. Clean milk production does not in fact, at the present time, yield safe milk. Mr. Bibby contends that pasteurisation spoils the nutritive value of milk, basing his argument on reports which have been shown to be without validity. His pamphlet leaves one with the feeling that he must have been a Bourbon in a previous reincarnation, for he forgets none of the old discredited views and learns nothing from the facts in favour of pasteurisation which have convinced scientific students.

Synopsis of Materia Medica, Toxicology and Pharmacology

(3rd ed.) FORREST RAMON DAVISON, BA, PH D, MB. (Kimpton. Pp. 759. 32*s.* 6*d.*)

IN the larger pharmacopœias and codices it has long been customary to vivify the desiccated facts of materia medica by the inclusion of explanations of drug action and references to therapeutics. Dr. Davison stresses these aspects and devotes much space to ad-hoc pharmacology. The subject is not treated from that viewpoint of fundamental experiment which is essential for the younger undergraduates, but forges a sound link between theory and practice, and can be strongly recommended for use in immediate postgraduate years. Precise details are given of preparations—proprietary and official—doses, concentrations, and modes of administration. There are adequate references to published work for those who wish to pursue their interest further. When groups of closely allied drugs (for example, the barbiturates or gastric antacids) are under discussion, sufficient pharmacological data are supplied to enable the reader to discern the appropriate differential indications for the employment of each. The book is one of the most compact and comprehensive volumes of its type. It amply fulfils the needs of the practitioner who wishes to understand his drug craft.

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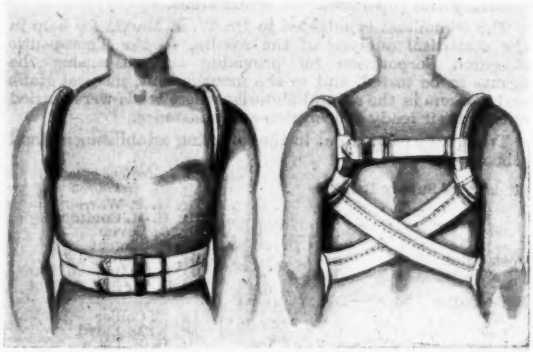

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The splint is made by Messrs. Down Bros., Ltd., to whom I am indebted for the illustration.

B. WHITCHURCH HOWELL, FRCS.

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THE LANCET

LONDON: SATURDAY, SEPTEMBER 16, 1944

Central or Local Control?

"If people are to have a right to look to a public service for all their medical needs, it must be somebody's duty to see that they do not look in vain. The right to the service involves the corresponding duty to see that the service is provided. Some organisation has to carry that duty, and as the service is to be publicly provided this involves responsible public authority in some form."

FROM this fundamental passage in their white-paper on a National Health Service the Government went on to declare in favour of "local responsibility, coupled with enough central direction to obtain a coherent and consistent national service." To discharge the local responsibility they proposed a new form of health authority, a joint board, which should take over the hospitals owned by its constituent local authorities and administer the medical services on an area plan to be made with professional guidance and approved by the Minister of Health. In their "positive proposals" [1] the council of the British Medical Association rejected this solution: instead of executive joint boards they suggested regional councils to *advise* the Minister, leaving him to see that the advice is carried out. A similar bias towards central rather than local control is seen in the proposals now made on behalf of the voluntary hospitals by the British Hospitals Association [2] and by King Edward's Hospital Fund for London. These, like the BMA council, approve of regional planning over large areas, but would give the regional planners no administrative powers. Local control ordinarily means control by local electors, and the King's Fund, in a memorandum accompanying the statement of principles reproduced on p. 387, say that "the principle of accountability to the public through the local government machinery has so far proved disappointing."

The proposals of the BHA and the King's Fund, which are closely similar, are designed to give the voluntary hospitals "a real and effective share at each stage, local and central, in the planning of the hospital service for a given area" and to prevent local authorities from becoming paymasters to voluntary hospitals. Members of the Government have referred to the voluntary hospitals' "partnership" in the new service, and the King's Fund speak of "the need of bringing together at each level round a common table the voluntary and local authority personnel." Regional planning would be done by regional hospital councils (having medical advisory committees) consisting primarily of representatives of local authorities and voluntary hospitals, in equal proportion, together with representatives of the consultant services; these would plan in detail the hospital, consultant and specialist services of their region. In smaller areas, often corresponding to counties, there would be local hospitals councils, similarly constituted, which would facilitate personal contact and understanding, and supply information to the regional planners. At the centre would be a Central Hospitals Board, again representing local authorities, voluntary hospitals and consultants. This would resemble the Central Medical Board already proposed, and at least some of its members would give their whole time to its work: it would be in charge of the inspection of hospitals and the development of services, and would advise the Minister "upon the basis on which payments should be made both to voluntary hospitals and to local authorities in respect of their hospitals." Voluntary hospitals would receive payment from central funds, not from local authorities; the amounts payable would be calculated not on a simple "per bed" formula, but according to the kind of services rendered, and would take no account of endowments or other resources. The hospitals must remain able to appeal to patients and potential patients for financial support; apart from the publication of audited accounts they must not be asked to account in detail for their expenditure; and they must be on equal footing with municipal hospitals as regards receiving capital grants from central funds for hospital purposes. A clear assurance on this last matter would, it is felt, "go far towards meeting the widely felt apprehension that the voluntary system may gradually come to fall into relative obsolescence by reason of a readier access to public monies on the part of local authorities."

The Government asked for constructive criticism, and the voluntary hospitals have given it. No-one can read these memoranda without agreeing that they offer a possible alternative to the Government's own scheme. It is equally apparent however that an important consideration in drawing them up has been to put the voluntary hospitals into a position of strength; and perhaps less thought has been given to the state of local-authority hospitals—which provided 212,000 of 303,000 hospital beds (of all sorts) in Great Britain before the war. One of the great merits of the white-paper scheme is that all municipal hospitals are to be taken over and directly controlled by a comparatively small number of health authorities of a new type which would have medical guidance and an opportunity to employ first-class staff in planning and administration. Neither the BMA nor the BHA nor the local authorities like these joint boards; but an effective executive body in every area is the only means of securing anything like quick results. Remote control by a Ministry or board in Whitehall, exercising power chiefly by withholding grants to backward authorities, would work improvement so slowly and unequally that good service could not be guaranteed to citizens everywhere within a measurable time. In each locality "it must be somebody's duty to see that they do not look in vain," and in each locality the people responsible for planning should also be responsible for administration. Surely this can be achieved without impairing the healthy independence of the good voluntary hospital.

1. *Brit. med. J.* 1944, i, 643.
2. A National Health Service. British Hospitals Association, 12, Grosvenor Crescent, London, S.W.1. See *Lancet*, August 19, p. 264.

Primary Atypical Pneumonia

THE rise in incidence of primary atypical pneumonia in the last few years seems largely a genuine rise, and not merely the reflection of better recognition. In the year since we published a small symposium on the disease [1] hundreds more cases have been reported,

1. Drew, W. R. M., Samuel, E. and Bell, M. *Lancet*, 1943, i, 761. Turner, J. C., Nisnewitz, S., Jackson, E. B. and Berney, R. *Ibid*, p. 765. Kennedy, J. A. *Ibid*, p. 769.

mostly from the United States, the clinical picture has been more clearly differentiated from that of other infections of the respiratory tract, and we have learnt more about its course and morbid anatomy. Young adults are most commonly affected. The onset is gradual, with pyrexia and signs of upper respiratory infection, both usually moderate; the patient complains of vaguely localised pain or tightness in the chest, but he does not feel short of breath and his respirations are not accelerated; the cough is irritable and persistent, with greenish mucopurulent sputum; there is no cyanosis and herpes labialis is uncommon. Localised râles are the prominent sign in the lungs; there is seldom dullness to percussion, and bronchial breath-sounds are rare. The various X-ray findings were well described by DREW, SAMUEL and BELL [1]; the radiogram shows small areas of moderately dense opacity, rarely involving a whole lobe. The disease seems to have a special predilection for the lower medial zones of the lungs—the cardiophrenic zone in the radiogram—and on the left side the cardiac shadow may obscure most of the opacity. The upper lobes and right middle lobe may also be involved, but it is uncommon to find more than one area affected. There is no significant leucocytosis, and culture of the sputum does not show any predominant organism. The disease is usually mild and terminates by lysis. All writers agree that the sulphonamides are without effect, though in a few cases where the pyrexia has lasted unusually long sulphonamides in full doses seem to have started the temperature falling, perhaps by acting on secondary invaders. Clinical recovery takes 7–14 days, but clearance of the radiogram may take twice as long; it is generally agreed that in Service cases the men should not return to duty until the radiogram is normal. Complications and second attacks are rare and complete recovery is the rule, though OWEN [2] has seen 17 recurrences in his 738 cases, 2 patients having three attacks each. Differential diagnosis presents few difficulties, except in the upper lobe cases, when the resemblance to tuberculous infiltration may be close; observation and serial radiograms will give the answer, since the atypical pneumonia clears in 2–3 weeks.

A few patients with atypical pneumonia have died (some from other causes) and the autopsy reports agree that this is an "interstitial" pneumonia. There is inflammation of the bronchi and bronchioles with infiltration and exudate in the peribronchial and bronchiolar tissues; these passages become blocked and the corresponding areas of lung then collapse, producing the radiographic appearances. The lung findings are similar to those in known virus diseases, and evidence is accumulating that this is a virus disease also. WEIR and HORSFALL [3] transmitted the disease from patients to the wild mongoose four years ago, and ROSE and MOLLOY [4] have since successfully transmitted it to young guineapigs. MEIKLEJOHN, BECK and EATON [5] have recently confirmed the presence of psittacosis-like viruses in some cases, but they say that the proportion showing such organisms is small and the positive cases are as a rule especially severe. EATON, MEIKLEJOHN and HERICK [6] consider that 90% of the cases are attributable to new or unidentified viruses; from some patients they have been able to transmit to chick embryos a filtrable virus obtained from filtered sputum or (in fatal cases) a suspension of lung tissue; then intranasal inoculation of the chick tissue into cotton-rats or hamsters produced pulmonary lesions similar to those produced by direct infection with human material. The chick-embryo agent could be neutralised by convalescent serum from patients with atypical pneumonia, but not by serum from patients in the acute phase. The method of passage through chick embryo was used to avoid confusion with respiratory agents normally present in the rodents utilised. Further passage with the rodent lung material failed, and these workers suggest that another toxic factor may be needed to act together with the virus to produce the characteristic lesions.

FAVOUR [7] thinks there is a tendency for the incidence of atypical pneumonia to run parallel with that of the much commoner tracheobronchitis but not with those of colds and sore throats. Numerous epidemics of atypical pneumonia have now been reported from military camps and elsewhere when overcrowding is unavoidable. OWEN [2] found that 1750 military and 1100 civilian cases had been reported up to early this year, and he added another 700-odd from a military camp. CAMPBELL and his colleagues [8] reported 200 cases, with but one death, from myelitis; CORRELL and COWAN [9] described 155 cases in the US Navy; and NEEDLES and GILBERT [10] 125 with one death. DINGLE and collaborators,[11] acting on behalf of an official commission of inquiry, studied 69 cases of atypical pneumonia and have published their findings in great detail; but their results confirm those already referred to and do not add any new point of importance; they too incline to the virus theory of infection and think that unaffected carriers play an important part in the spread of the disease. These were all American studies and the list is by no means complete. The disease was common in Britain last winter, and mass radiography in the Forces has revealed some cases that caused so little disability that the patient dismissed his illness as a cold; KENNEDY [1] described some examples in the RAF.

From the military point of view atypical pneumonia is serious because of the long period before men are fit to return to duty; OWEN calculated that at his camp 55 man-years were lost in one year from this cause. Thus primary atypical pneumonia is a war disease to be reckoned with, and until more specific means are devised preventive measures must follow the general lines found effective in other respiratory infections, as far as war conditions will allow—avoidance of overcrowding and undue exposure to wet and cold, especially while men are new to the Service, supported by accurate ascertainment of early cases, and attempts to lessen air-borne infection by laying dust and using aerosol sprays.

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4. Rose, H. M. and Molloy, E. *Science*, 1943, **98**, 112.
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9. Correll, H. L. and Cowan, I. I. *Nav. med. Bull., Wash.* 1943, **41**, 980.
10. Needles, R. J. and Gilbert, P. D. *Arch. intern. Med.* 1944, **73**, 113.
11. Dingle, J. H. et al. *Amer. J. Hyg.* 1944, **39**, 67, 197, 269.

Avoiding Delay in Bone Union

FRACTURES seem to be uniting more slowly nowadays, but WATSON-JONES [1] points out that the rising incidence of delayed union is more apparent than real, and is largely due to our having substituted a radiographic for our fathers' clinical criterion of union. We retain splintage for longer than they did and, as a result, can claim a far smaller incidence of non-union. A recent MRC memo [2] discusses what the surgeon can do to avoid delay, as distinct from treating it, and what factors are beyond his control. The emphasis on a clear distinction from non-union is important. For, by definition, where union is merely delayed it will take place if immobilisation is continued long enough, though some surgeons [3] urge that we should not always wait to demonstrate the fact, and ARMSTRONG [4] has set out indications for grafting the tibia and scaphoid in cases of simple delayed union. But operation is the only way of dealing with a fracture when experience tells us it will not unite at all; thus a fractured scaphoid may already be sclerosed and non-union established at 12 weeks, a moment ripe and proper for grafting—before the onset of arthritis—that will not recur. Causes of delay outside surgical influence include excessive trauma with comminution, multiple fractures, or detached fragments unable to contribute to callus formation; avascularity of one fragment, as in the femoral head and the proximal half of some scaphoid fractures; and an inherent sluggishness in callus formation in spite of adequate treatment—what FAIRBANK [5] calls "idle bones." It is possible too, as BOURNE'S work [6] suggests, that lack of vitamin C may be a contributing factor; but, though complete deprivation certainly seriously interferes with union, the evidence of any such result from minor vitamin deficiency is incomplete.

Accurate reduction and good apposition are laudable aims, but the reduction of fractures not seen until after 10 days may damage the local hæmatoma, and attempts at apposition may then defeat their own end. Late manipulations of this kind, and inadequate or interrupted immobilisation after the third week, as well as premature abandonment of fixation, are all serious causes of delay. Adjustment of alignment is less dangerous but may still fracture the crystallising callus if not done early, and any unwise attempt to adjust a fracture after the first few weeks may retard union by many days. Changes of plaster should be infrequent and the limb always guarded when the plaster is off, particularly while being X rayed; one movement of the wrist may put a fractured scaphoid right back to the beginning. Premature weight-bearing on badly aligned oblique fractures imposes a continuous shearing strain on the fracture site which often leads to late yielding. The essence of this advice on the manipulative aspect of delayed union is to get the best reduction possible as soon as possible and then to leave well alone; length and alignment are more important than accurate radiographic results, the fastidious pursuit of which may lead to the last state being worse than the first. The malign influence of distraction of bone-ends by skeletal pull in hindering union deserves special mention. It is the fact of separation and not the amount that matters; once the bone-ends have been pulled apart the damage has been done. Immediately distraction is recognised the weight should be reduced and the ends forced into contact; slackening of pull alone may merely reproduce the original overlap. It must be remembered that the appropriate stimulus for the osteoblast is compression and that traction is meant to maintain length and no more. If applied early, as it should be, correction can be rapidly obtained with a heavy weight and then held with 10–15 pounds only; but in a few hours the muscles become swollen and inelastic and a much heavier pull is necessary. Then, as GIRDLESTONE [7] graphically describes, "stretched by the weight and starved by the muscular spasm, the tissues round the fracture change from a vascular matrix to barren, white fibrous tissue; it is small wonder fractures so treated unite very slowly if at all." The overlong retention of transfixion pins above and below the fracture will certainly maintain any distraction and prevent muscle impaction of the ends; an upper pin is quite superfluous for transverse fractures. This, with its other complications, accounts for the unpopularity of ambulatory transfixion in this country, in spite of ROGER ANDERSON'S [8] contention that it is the method of choice and one with no bias to slow union.

In compound fractures, infection prolongs union not only in virtue of the hyperæmia which leads to a soft callus, but because the surgeon's efforts to check it often interfere with fixation; in infected fractures immobilisation is more, not less, important than in other cases. Treatment consists of drainage; chemotherapy with sulphonamides or penicillin (there is no evidence that local sulphonamides even with a 1% proflavine admixture delay union unless in excessive amounts); and sequestrectomy as soon as fragments are loose, which is rather earlier than radiograms suggest. The loss, however, of a whole segment of the bone cylinder by injury or sequestration provides an important exception to the general rule of favouring the collapse and impaction of the fragments. Here proper length must be maintained, for its own sake and because otherwise a flap of periosteum is interposed. Early skin-grafting minimises hyperæmia and also prevents the wound healing with a deep scar of connective tissue strangling the blood-supply to the bone ends. Grafting may be possible at the primary excision, as in wounds over the tibia with little muscular damage; but if not it should be carried out later, even if only a partial covering is possible and a sinus inevitable.

To sum up, the surgeon has three main responsibilities if he is not to waste time in treatment—to maintain adequate and uninterrupted immobilisation, to avoid distraction, and to combat infection. These things are within his power, and since the first two are mainly concerned with avoiding overtreatment and unnecessary treatment he must acquire a wise restraint. If he thinks in terms of the physiology of the fracture site, and of function rather than hair-line reduction, he will not go far wrong.

1. Watson-Jones, R. *Brit. J. Surg.* 1943, **30**, 260.
2. *Bull. War Med.* 1944, **4**, 559.
3. Ellis, V. H. *Lancet*, 1944, i, 421.
4. Armstrong, J. R. *Ibid*, 1943, ii, 188; 1941, i, 537.
5. Fairbank, H. A. T. *Ibid*, 1944, ii, 131.
6. Bourne, G. H. *Proc. R. Soc. Med.* 1944, **37**, 275.
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8. Anderson, R. and Burgess, E. *J. Bone Jt Surg.* 1943, **25**, 427.

Annotations

PATULIN DISAPPOINTS

PATULIN has now been given a large-scale clinical trial, and the results are as disappointing as those of the smaller first trial were encouraging. In the early months of last year, after some success had been reported by Prof. W. E. Gye and his colleagues in the treatment of their personal colds, Hopkins [1] supervised an extended trial at a Royal Naval depot in south east England. In his main group, 95 men were treated with patulin in a phosphate buffer and 85 with the buffer solution only, the patulin dilutions ranging from 1 in 20,000 to 1 in 5000. The solutions were sprayed into the throat and nose with a De Vilbiss spray, every 4 hours during the daytime for 24–72 hours. Results were assessed at 24 and 48 hours, and to be classed as cured a man had to be completely free of symptoms and signs within 48 hours of commencing treatment. A large number of the cured patients noted a great improvement after the first application of patulin and were completely cured within 24 hours. Altogether, of the 95 men treated with patulin, 55 were cured within 48 hours, compared with 8 cured among the controls. Stated as a percentage, the rates of cure were 55% in the patulin group and 9·4% in the controls. In his statistical note to Hopkins's paper, Greenwood [2] said that in random sampling so wide a divergence in favour of the treated would occur about 3 times in 10,000 trials.

Now in our present issue two further trials are reported, one in the Army during March and Aug.–Sept. 1943; the other, sponsored by the Medical Research Council, in factory and post-office workers and public-school boys during Jan.–April, 1944. In both trials the patulin was dispensed as a 1 in 10,000 solution in a phosphate or citrate buffer, the buffer solution alone acting as control. In the Army trial the patient lay on a couch and the solution was sprayed up his nose and into his throat with a De Vilbiss spray, a few drops being also instilled into his nostrils. The MRC workers, for the main part of their trial, adopted the "head-low" position advised by Cawthorne, the solution being run into the nostrils while the patient lies on his back on a couch with his head hanging over the end. The Army patients received 8 treatments within 48 hours; the MRC patients 8–12 treatments. The Army series consisted of 50 treated and 50 control patients; of these only 6 treated and 11 controls were reported "improved" within 48 hours; and in no less than 29 treated and 29 controls the colds lasted more than a fortnight. In the MRC series there were 668 treated cases and 680 controls; of these, 13% of each group were cured at 48 hours, and an additional 60% of treated and 64% of controls were improved at that time.

In the Naval trial, then, the prima-facie inference was in favour of the treatment; in the Army and MRC trials the probability pointed to the treatment being ineffective. We must now choose between two hypotheses: (*a*) that in the Navy trial a rare event happened—as of course it will, rarely—or (*b*) that patulin did have a good effect on the particular organisms responsible for the Navy colds. Most of us will vote for (*b*). There is, theoretically, a third possibility, that in the Navy trial the patients given patulin guessed it and were psychologically influenced, but Hopkins took every care in advance to rule that possibility out: in one batch none of those conducting the trials knew till the results were assessed which men had received patulin and which buffer alone, yet the results in this batch were just as strikingly in favour of the treated group. The lesson of these inquiries is that no remedy for colds must be judged until it has been submitted to a large-scale trial. The experience gained will be of inestimable value when further remedies come up for test.

1. Hopkins, W. A. *Lancet*, 1943, ii, 631.
2. Greenwood, M. *Ibid*, p. 634.

DIALLING TUM

THE sinister significance of the completely silent abdomen of paralytic ileus, following as it often does the active noisy contractions of early intestinal obstruction, is well recognised. The abdominal surgeon is accustomed to listening-in to the gut when assessing the stage of an obstructive lesion and the amount of damage done to the motor power of the intestinal wall. But abdominal auscultation is not such a common practice that the less striking departures from the normal are at once recognised, nor can the significance of sounds at various levels be at once related to the part of intestine producing them. Since he went back to South Africa, Copley [1] has made a habit of abdominal auscultation, and he now looks on it as an accurate means of diagnosis in inflammatory and obstructive abdominal lesions. The normal sounds heard are, he believes, produced in the small intestine. The opening and closing of the pylorus is inaudible, and the large intestine is normally silent, except in the presence of an urgent but suppressed desire to defæcate, when listening to the left iliac fossa will reveal rhythmic sounds of a low-pitched quality, resembling the sound produced by gas under tension released through water. The opening of the ileocæcal valve produces a low rumbling squelch, occurring once every 45 seconds, heard best at McBurney's point. The small intestine sounds are irregularly spaced in time, short in duration, small in volume and of medium pitch. Above the umbilicus these sounds are jejunal in origin. Below the umbilicus they are mainly in the ileum. Early in appendicitis the small intestine sounds continue normally, but the action of the ileocæcal valve becomes less and less audible. As soon as the inflammation is completely walled-off, as in an appendix abscess, the abdominal sounds return to normal. Extreme irritation of the peritoneum, as in a perforation of a peptic ulcer, causes almost immediate cessation of all abdominal sounds. Less severe irritation, as by the extravasated blood of a ruptured ectopic gestation, muffles the sounds, but they can still be heard. Salpingitis may diminish the volume of the small intestine sounds, but will not affect the opening and closing of the ileocæcal valve. Paralytic ileus, whether arising from septic peritonitis or as a postoperative complication, produces a characteristic sound picture. The ileocæcal valve is not working, and the sounds of intestinal peristalsis are absent. Two types of sound are, however, to be listened for. The small intestine gives rise to occasional faint tinkling noises, probably produced by alterations in the gas and fluid levels inside the coils of gut. When the jejunal coils get distended and overloaded with fluid, the heart sounds are strongly conducted as far down as the umbilicus. Acute enteritis, as it increases the frequency of small intestine contractions, also makes the normal abdominal sounds more frequent, but their quality remains the same. Intestinal colic can therefore be distinguished from early appendicitis by the comparative silence of the ileocæcal valve in appendicitis. Spreading peritonitis in a case of appendicitis can be diagnosed by the damping down of the small intestine sounds. Mechanical obstruction of the small intestine first makes the sounds in the upper abdomen recur more quickly, the lower abdomen being silent. Later the abdominal sounds in the upper abdomen become progressively less, shorter in duration, and tinkling in quality, until finally the paralytic abdomen is produced. The ileocæcal valve sounds cease at the onset of acute small intestine obstruction. Large intestine obstruction commonly starts more gradually, and until the small intestine becomes affected the sounds heard are those of a very active large bowel; the contractions, in fact, are often

1. Copley, A. C. *Sth Afr. med. J.* 1944, **18**, 194.

palpable and visible. The decision whether to employ a right-sided or left-sided incision commonly hinges on the differential diagnosis between large and small intestine obstruction, so help in this diagnosis is valuable. Low-pitched, loud and protracted borborygmi are characteristic of large intestine obstruction, and an active ileocæcal valve means that the function of the small intestine is not yet destroyed. Later in large gut obstruction the sounds first below and then above the umbilicus are silenced. Postoperative auscultation of the abdomen is an aid both to prognosis and to treatment. A decision on the relative advantages of aperients or of decompression of the gut by duodenal suction may depend on what the intestine says it is doing, or not doing.

THE TONGUE IN DIAGNOSIS

WHETHER there was much substance behind the wise look of the old-time physician as he felt the patient's pulse and looked at his tongue may be problematical, but Anderson[1] has found a firm basis beneath some at least of our traditional tongue signs. A dry tongue may be due to three main causes, the most important of which is dehydration, and in a person who is not a mouth-breather and has not just been indulging in hard physical exercise, provided there is no local infection of the mouth or tonsils, a dry tongue indicates an immediate need for fluids, by mouth or by some other route. The other, less important, causes of a dry tongue are increased sympathetic tone (or diminished parasympathetic tone), the probable explanation of the parched tongue that has cramped the style of so many nervous candidates at a viva voce examination, and mouth-breathing. Anderson believes that the furred tongue is due to toxæmia which produces proliferation of the papillary epithelium. This may well explain many cases, but other factors also come into play, such as diminished friction due to inadequate mastication or inadequate salivation. A moderate degree of furring, especially of the posterior third of the tongue, occurs in many people who are apparently in good health, particularly if they are smokers. Many would go farther and say that, except in children and non-smoking adults, it is rare to find a perfectly clean moist tongue. Milk must also be recognised as among the most potent causes of a furred tongue, though here the white colour of the fur usually makes the diagnosis easy. Perhaps the "dirtiest" tongue is found in the patient with acute tonsillitis. One of the most characteristic of tongues is the dirty brown dry one of uræmia, an appearance which, combined with an ammoniacal odour of the breath and drowsiness, makes a picture that is as classical in its appearance as it is tragic in its prognosis. The "toxæmic" theory is probably the best explanation of the furred tongue of constipation; as Anderson points out many constipated but otherwise healthy people have a clean tongue. In the diagnosis of the anæmias the tongue is gradually regaining the position from which it was displaced by the hæmatologists twenty years ago. Few signs are more diagnostic than the tongue in pernicious anæmia, though it is not in the least like raw beefsteak, not even a miserable war-time one; much more descriptive is the term, canine tongue. Almost as characteristic is the pale flabby tongue often seen in microcytic anæmia. Riboflavin deficiency produces a tongue which, according to Stannus,[2] is easily recognised, though he doubts its diagnostic value unless it accompanies other manifestations of this deficiency. Manson-Bahr,[3] on the other hand, lays considerable emphasis upon the importance of glossitis in pellagra, sprue and allied states, and has actually described a condition known as "tongue sprue," where the sprue process may be confined to the buccal cavity for years. Stannus describes the tongue in riboflavin deficiency as being clean, smooth, and purplish red or magenta. At a later stage the surface may be denuded in patches, resulting in the "geographical tongue." This term is also used to describe a tongue which is said to be of no clinical significance, though Anderson has never seen it in "anyone who was robust and very well."

1. Anderson, D. *Med. J. Aust.* 1944, i, 309.
2. Stannus, H. S. *Brit. med. J.* 1944, ii, 140.
3. Manson-Bahr, P. *Lancet*, 1940, ii, 317.

OPERATION FOR FISTULA-IN-ANO

THE operation for fistula-in-ano commonly performed in England leaves the patient with a wound which has to heal by granulation, and this takes long enough to tax the patience of all concerned. Costantini and Curtillet,[1] at a meeting of the Société de Chirurgie d'Alger, advocated suture after excision of the fistulous tract, and claimed that most of their cases were entirely, and they hoped permanently, cured in 8–10 days. They discussed whether the mucosa only should be sutured, or whether the skin should be included, deciding that both structures should be sutured in all cases involving deep excision of the tract with division of the fibres of the sphincter. Cabanie,[2] on the other hand, practises mucosal suture, leaving the skin to heal by granulation. Until recently the mucous part of the wound has been united by a few interrupted stitches combined with one or two larger catgut sutures passing through the anal sphincter. His technique is to use one suture only, of silver wire 0·7 to 0·9 mm. in diameter, inserted with a large Hagedorn needle. This stitch passes through the edge of the wound near the anal margin, picks up the sphincter first on one side and then on the other, and reappears through the far side of the wound without appearing in its depths at all. The stitch is secured and the ends left moderately long. It is left in for 12 days, without inconvenience to the patient. Healing, Cabanie claims, is more rapid than by any other method and at least as sure. His experience is that a fistula not complicated by an abscess should be completely healed by a single operation, and without complications or pain. No substitute for the silver wire is permitted. In war-time this is a drawback, for it is difficult to obtain silver wire for suture in this country.

1. Costantini, J. and Curtillet, E. *Afr. franç. Chir.* 1943, **1**, 155.
2. Cabanie, M. G. *Ibid*, p. 224.

PARAFFIN AS MEDICINE AND FOOD

FEW will deny the value of medicinal paraffin for the alleviation of constipation. Its action is mild but efficient. There is little stimulation of the intestinal mucosa, as occurs with cascara, nor any violent disturbance of osmotic pressure, as with mineral salts. Instead the fæces are softened by dilution of their normal fatty constituents with a bland inert oil, which allows the motions to be passed with little muscular effort and with a minimum of irritation to hæmorrhoids or other lesions. Paraffin which escapes incorporation in the fæces may act as a lubricant between the stools and the colonic mucosa, although excess may cause minor discomfort through seepage. Recent shortage of edible fats has suggested further uses for paraffin. It is not always remembered that fats have two distinct functions in nutrition. Firstly, they supply energy in concentrated form and often act as carriers of one or more of the fat-soluble vitamins. Their second function is to assist in the assimilation of other foodstuffs. Thus, butter acts as a lubricant to facilitate the consumption of bread, suet combines with flour to give puddings their attractive texture. Although paraffin is quite valueless in the primary rôle as a source of energy or vitamins, it can be used successfully in many ways to replace fats in their secondary rôle.

The most extensive use of paraffin as a foodstuff has been in the manufacture of salad creams in America. To claim a virtue for their low food value these preparations are often described as "slenderising" or "non-fattening." From the manufacturer's point of view,

paraffin has advantages over vegetable and animal oils. Although it lacks the attractive flavour of olive oil it has no undesirable taste to be masked, and it therefore provides a good medium for sophisticated seasoning. Even more important is the immunity of paraffin to rancidity, which reduces trouble from deterioration during storage. Directions for making home-made salad cream from paraffin have appeared in our own daily press, with recipes for cakes containing medicinal paraffin in place of the usual butter or margarine. As far as taste is concerned the results are excellent.

How far is this boon to the cook a blessing to the consumer? Several objections to liquid paraffin as a common article of diet—and indeed to its habitual use as a medicine—may be based on the results of animal and human experiments. Probably the most serious is interference with the absorption of carotene. The reduced vitamin-A activity of carotene when dissolved in paraffin was reported by Moore [1] fifteen years ago, and has since been confirmed by many American workers. Mitchell [2] claimed that the doses of spinach necessary to supply the vitamin-A requirements of rats had to be increased 10–12 times when large doses of paraffin were given at the same time. In human subjects Curtis and Kline [3] observed that doses of paraffin given three times daily greatly reduced the level of carotene in the serum, although this effect was avoided if the paraffin was given as a single dose at bedtime. It is estimated that each fluid ounce of paraffin can dissolve 140,000 IU of carotene at body temperature. Fortunately the absorption of preformed vitamin-A is not similarly affected, but the absorption of vitamin-D [4] and of vitamin K [5] is seriously impaired. A second course of anxiety lies in the proof by Channon [6] and others that the freedom of paraffin from absorption is not as complete as was once supposed. Paraffin was unmistakably detected in the livers of rats and pigs which had been given large doses. Stryker [7] has since found pathological changes in the liver, consisting of vacuolated cells and extracellular vacuoles, after feeding large amounts of paraffin to rats, rabbits and guinea-pigs for a long period. No early lesions were seen in guineapigs, but rabbits had white nodules in the intestines, while in rats the mesenteric lymph-nodes were similarly involved. Vacuoles were also found in human mesenteric lymph-nodes obtained at autopsy, and paraffin was recovered and identified by chemical means.

Apart from the experimental approach with animals, Morgan [8] has reported harmful clinical effects from excessive dosing with mineral oils. Anorexia, indigestion, flatulence, fatigue, nervousness, dyschesia and loss of weight have been observed, and have been checked by withdrawal of the paraffin. It is not surprising, therefore, that the Council of Food and Drugs of the American Medical Association should withdraw its approval of salad oils made with paraffin. In healthy subjects little or no harm is to be expected from the occasional use of paraffin, either as a laxative or as a dietary substitute for genuine fat, although when paraffin is taken in the food unexpected intestinal action may sometimes be inconvenient. The regular use of paraffin, however, has real objections. When the patient's condition is such that the facile passage of fæces is of primary importance the administration of paraffin should be accompanied by extra green vegetables, to supply carotene and vitamin K, and halibut-liver or cod-liver oil to supply extra vitamins A and D. If the paraffin is given at bedtime, as advised by Curtis and Kline, the liver oil should be given in the morning, so that the absorption of vitamin D is influenced as little as possible.

1. Moore, T. *Biochem. J.* 1929, **23**, 1267.
2. Mitchell, H. S. *Proc. Soc. exp. Biol NY*, 933, **31**, 231.
3. Curtis, A. C. and Kline, E. M. *Arch. intern. Med.* 1939, **63**, 54.
4. Smith, M. C. and Spector, H. *J. Nutrit.* 1940, **20**, 19.
5. Elliott, M. C., Isaacs, B. and Ivy, A. C. *Proc. Soc. exp. Biol. NY*, 1940, **43**, 240.
6. Channon, H. J. and Collinson, G. A. *Biochem. J.* 1929, **23**, 676.
7. Stryker, W. A. *Arch. Path.* 1941, **31**, 670.
8. Morgan, J. W. *J. Amer. med. Ass.* 1941, **117**, 1335.

EMOTIONAL FACTORS IN ILLNESS

THE emotional and social factors of illness can be studied usefully in the outpatient department of a general hospital, provided there is enough staff with enough time for the job. Thus at Johns Hopkins, Robinson [1] has studied some hundreds of patients in the general medical and special departments from this point of view. After the patient has been examined physically he is interviewed with the express design of letting him tell what is on his mind about his illness, his social situation, his life, his work, his recreations, his worries and frustrations. The physician had an opportunity to assess emotional tension in the home or at work, to note what subjects the patient evaded, and to consider his adjustments to sex. Several interviews were usually held, and many patients were visited in their homes, where it was also possible to talk to their relations. The data collected in this way were recorded by dictation and studied at leisure. He found that two-thirds of the outpatients were confronted with adverse social conditions which were related to their illnesses; and in over half the patients these adverse conditions were causing emotional disturbance. Emotional disturbances were often present in patients with organic disease, but they were also the chief cause of the illness in many cases. The investigations suggested various important lines of treatment and the conviction—not a new one, naturally, but one easily forgotten—grew in him that the study of the patient as a whole and as a person is essential to good medical practice. Moreover he found that patients' difficulties often threw light on problems in public health and preventive medicine. Emotional disturbance may be provoked or aggravated by family congestion, inadequate protection from infectious illness, poor nutrition, unfavourable conditions of work, and lack of recreation or of other outlets. Studies such as his are likely to find the holes in existing medical services: in America, as here, people sometimes find it difficult to get appropriate medical care at the first evidence of illness. In some cases a chance discovery gives an opportunity for simple but telling reform. Robinson quotes the case of a coloured boy, discharged from a school for delinquents because he had tuberculosis. The public-health nurse said he was the fourth boy with tuberculosis whom she had visited after discharge from this institution. This awoke Robinson's interest, and led to his being appointed to the school's governing board. As a result of measures which he was then able to initiate—including tuberculin tests and X-ray examination of all positive reactors—the institution has been kept free of active tuberculosis for the past four years. He feels that medical practice should be organised so that the study of an individual patient leads freely and naturally to the study of preventive medicine, public health and mental hygiene as they relate to him; and that in the medical curriculum greater emphasis should be laid on methods of dealing with the emotional and social components of health and illness.

1. Robinson, G. C. *Bull. Johns Hopk. Hosp.* 1944, **74**, 259.

THE POSTPONED CONFERENCES

IF the war situation permits, the Annual Representative Meeting of the British Medical Association will be held in London on Tuesday, Dec. 5 and succeeding days, when the main business will be to consider the Association's policy on a comprehensive medical service, with special reference to the Government's white-paper. The Panel Conference will be held on Thursday, Nov. 2, continuing if necessary on Friday. Both conferences were to have been held during the summer but were postponed because the Government discouraged railway travel.

Special Articles

THE WOUNDED FROM NORMANDY

III. SEA OR AIR EVACUATION?

(FROM A SPECIAL CORRESPONDENT)

EXPERIENCE of air evacuation to date provides good evidence of its great usefulness. When I asked one of a large number of men brought over by air what was the least comfortable part of his journey, he said unhesitatingly, "The hour in a motor ambulance to the airstrip in France." The air journey itself presents no inconveniences save under quite exceptional conditions.

For men evacuated by air an admirably equipped RAF hospital plays the rôle of one of the "port" hospitals, and the triage of wounded and their care is carried out with exactly the same thorough efficiency as in the hospitals of the Army, Navy and EMS in the case of sea evacuation. The high standard of the RAF medical service needs no emphasis from me, but I should mention that they have special problems; for example, they have to be ready, if occasion arises, to give treatment while flying. In the short journey from Normandy, however, this is rarely required, and at one EMS hospital the medical superintendent said that in about 1000 air-evacuation cases received since D-day, no treatment had been necessary during the journey of the Dakota from France to England.

POSSIBILITIES

It is clear that air evacuation of casualties from the front fighting areas to the lines of communication and to the base has certain advantages over a combination of road transport and sea transport, and has possibilities of wide extension. But the method of evacuation is dictated by the situation of the fighting and by the tactical medical problem. No one plan, for example, could be applied to fighting in China or Burma, the jungles of Malaya and the Western Desert. The present fighting on the Continent of Europe, where very rapid movement has been taking men over hundreds of miles in a period only measured in days, seems to provide a case where air evacuation may be called upon to fulfil a larger and larger part. In the early days in Normandy, which ended with the retreat of Von Kluge's army towards the Seine, the fighting areas were relatively near the coast and evacuation to England by motor ambulance and ship was easily manageable. Yet even then a large proportion of wounded came to this country by air, and the proportion tended to rise. With armies swiftly advancing across France, Belgium, Holland and Germany the advantage of air transport would presumably increase.

There are, however, other factors to be considered. One, of course, is the availability of air transports and pilots. Others relate to airfields or airstrips and to the control of the air forces in general. Nevertheless, making due allowance for considerations that may bear on the use of air transport for wounded, it seems worth while to put the case for its great extension.

In the fighting in France and Belgium before May, 1940, when conditions were to a large extent static, it was natural to establish large hospital bases in France, much on the lines of those in the 1914–18 war. But even at that time air transport played its part by keeping medical formations supplied with blood for transfusion from a base in England.

With the large-scale operations now covering a great area of Europe, would there not be a clear advantage in maintaining Great Britain as the main hospital base? This would mean that while the medical personnel of fighting units, field ambulances and hospital units were maintained to give the necessary medical attention to the advancing troops, all other hospitals and base organisations would be in this country. Any hospital bases in France or elsewhere on the Continent would be as mobile as possible. And the use of existing aerodromes and the provision of emergency strips would become a first-priority factor in arranging the medical services—more than ever a "combined operation" with the RAF. Though evacuation of all wounded from Europe by air might not be practicable, aircraft might well become the chief means of transport, and others would be used only if that was not available.

For the wounded the advantage of air transport is very great, not only because it avoids a sea passage which may be rough, but also because it takes only a few hours instead of the several days that may have to be spent on a carrier or hospital ship. The Dakota planes used take 18 stretcher cases as a normal load, and can take 2 more; and the planes can land and take off wherever there are reasonable facilities. I have already pointed out that in the opinion of medical officers intimately concerned with air evacuation there is no class of cases—even head wounds and perforating chest wounds—that are unsuitable for air transport. Special cases can always be dealt with in special ways; and indeed this is necessary under any circumstances.

The shortening of the period spent by casualties in travelling from the Continent to this country should still further improve chances of recovery. From the administrative standpoint also it would naturally be convenient to have the main hospital and medical supply bases in this country; for this would at a stroke eliminate a vast transport problem of supplies for the hospital services. The fighting-front medical services, including the advanced hospital organisation, would become as mobile as the infantry, and would in numbers and in supplies be reduced to a land transport problem of moderate dimensions—perhaps very moderate dimensions.

The development of medical services here suggested is in line with the development of the fighting forces generally—that is, it proposes an increase of mechanisation and a diminution of personnel and of supplies. A corollary to these proposals is that the medical services in the field would be largely air-borne and carry their parallel development with those of the infantry further still.

Air transport of wounded from France is carried on by Dakota transport planes on their homeward flights from France. On the outward flight these aircraft carry miscellaneous supplies; they can, for instance, take a jeep. But if air transport becomes the rule for casualties returning to this country, it may be possible to allot a regular establishment of Dakotas to a regular Dakota air-ambulance service. Planes used at present do not bear the red cross, but a regular air-ambulance service would certainly be entitled to do so. This last consideration may not have much importance at present in Europe, when the forces of the Allies have air superiority. But the air organisation proposed has obvious possibilities in the land war in China and Japan and over the Pacific, where the use of red-cross ambulances would have clear advantages.

Speculations on possible extension of air transport of wounded are very much in the mind of those concerned with their reception, transport and distribution. I talked of them with RAMC officers, I talked of them with the wounded themselves and I talked of them with the personnel of the ambulance train.

TRAIN AND HOSPITAL

The end of my journey was made in an RAMC train which left the airport and took its many passengers, its medical officers, and two very active medical students, up to Birmingham. We were met in the grey of the morning by the detraining officer from the EMS hospital, and the wounded were divided between the

hospitals that were to receive the convoy. As the train drew up in the siding, I saw a whole convoy of Civil Defence ambulances ready and waiting. There was also a mobile canteen for the use of all concerned, including the Civil Defence drivers and the staff on the train. And these Civil Defence workers, drivers, stretcher-bearers, all of them were volunteers getting up about five in the morning to do this job before going on to their ordinary day's work. They were silent and efficient, they wasted no time in talk, they just did the job swiftly and well. They gave a service for which the fighting men were very grateful and of which the Civil Defence may be very proud.

I went in with the hospital detraining officer to the Queen Elizabeth Hospital, and by that time it was getting near the breakfast hour. Everything in the hospital was ready, the casualties were rapidly allocated to their wards, and the men felt they had taken a long step forward on the road to recovery.

My last contact with the organisation for the time was sitting down to breakfast with the staff and the house-governor and discussing not only the organisation but the plans of the Government for a National Health Service. I nearly missed the 8.40 train to London because the discussion became so brisk.

But as in the beginning, so here at the end of my short tour, I was impressed by the feeling, and the reality, of the great coöperation of men and women, of civil and Service hospitals, and organisations all working together. I trust we can carry the same spirit into the perhaps piping, but possibly more critical, days of peace.

THE MINER WITH PNEUMOCONIOSIS

DUST is still an urgent problem in the mines and the report of an advisory committee of the Ministry of Fuel and Power[1] states that certificates of disablement from pneumoconiosis increased from 387 in 1939 to 985 in 1943 (a new compensation scheme came into operation in July, 1943) in a population that declined from 130,000 to 113,000 in the same period. It is expected that there will be further increases until the effect of dust suppression shows itself.

The committee are unable as yet to recommend any form of treatment as generally applicable; they regard inhalation of aluminium powder[2] as still in the experimental stage. Nor do they rely on any present method designed to restore the pneumoconiotic to his normal occupation. To increase knowledge, they advise that a small treatment and rehabilitation centre be established and they also favour intensive research on the pathological side, directed particularly to the basic causes of this complex disease. To gauge the efficacy of the newer methods of dust suppression, they propose that initial and periodic clinical and X-ray examinations of the miners should be carefully correlated with assessment of dust concentration and constitution. On the administrative side, it is suggested that a Pneumoconiosis Bureau should be established to coördinate work on the disease, and here the committee clearly have in mind the valuable service of the South African Miners Phthisis Bureau.

Among other recommendations is one for inquiry without delay into the present medical, social and industrial circumstances of the large number of pneumoconiotic miners now employed in other war industries. It is known that some men "totally disabled" for underground mining have found congenial and successful employment in light engineering, but all this information needs to be documented so as to guide those responsible—presumably under the Disabled Persons (Re-employment) Act, 1944—for retraining and placing pneumoconiotics in work individually or collectively. Much knowledge as to the work that suits different types of case is already obtainable for the asking, but with changes in production imminent the best opportunity for gathering it may soon be lost.

1. Treatment and Rehabilitation of Coalminers in the Wales Region Suffering from Pneumoconiosis. HM Stationery Office. 1944. Pp. 18. 3d.
2. *Lancet*, July 8, p. 50.

NUTRITION AND SIZE OF FAMILY

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IF we compare the adequacy of the incomes in families of different size, we find a decreasing adequacy of income with increasing size of family. First, in the community as a whole, the average total family income is greater in smaller families, since small families are commoner in the more well-to-do sections of the community. Secondly, within any one socio-economic group, the money available per head decreases as the size of family increases, since the total income bears little relation to the size of the family.

True some factors tend towards an increase in income as the family grows. A man may earn more when he is, say, 35 and has four children than when he was 25 and had one child. Later still, his older children may supplement the family income. In the Services and a few commercial undertakings, family allowances are provided, so that the income rises with each addition to the family. But these factors are not universal, and rarely is their effect in increasing the family income commensurate with the increased financial burden of a larger family. Not all men earn more at 35 than at 25; before the older children begin to earn they and their younger brothers and sisters may experience hardship, or actual poverty. Family allowances are rarely sufficient to supply the needs of the children: it is impossible adequately to feed and clothe a child for 5*s*. a week, an amount commonly advocated in recent discussions; even if social benefits worth 2*s*. 6*d*. "and even more" are added to this, as suggested in the parliamentary debate on the Beveridge plan, 5*s*. a week is unlikely to suffice.

In general terms, then, there will be a decrease in available income per head as a family increases in size. Thus families in which the available income is too low to provide an adequate diet are commonly those with a greater number of children, and reports such as that of the Birmingham Social Survey Committee (1942) bear this out.

Allowing only for rent and rates, they showed that the proportion of families whose net income was below that necessary to provide minimal needs rose from 3% in families with one child under 14 to 82% in families with six or more children under 14 (table I).

TABLE I—PROPORTION OF FAMILIES WITH NET INCOMES BELOW MINIMUM

(Quoted from Birmingham Social Survey)

Children under 14	Families below minimum (%)
1	3
2	11
3	27
4	55
5	60
6 or more	82

Taking "small" families as those with one or two children and "large" families as those with three or more children, the proportion below the minimum was 6% and 58% respectively.

TABLE II—NUTRITIONAL STATUS AND AVAILABLE INCOME OF 21 MOTHERS AND THEIR 82 CHILDREN, LIVING IN INDUSTRIAL TOWNS (FROM YUDKIN 1944A)

Average differences between higher and lower income groups.
Average income (income minus rent per capita):
Higher income group 12*s*. 11*d*. to 17*s*. 7*d*.
Lower income group 7*s*. 11*d*. to 12*s*. 11*d*.

	Children				Mothers	
	Height (in.)	Weight (lb.)	Hb. (%)	Grip (kg.)	Weight (lb.)	Hb. (%)
Difference	0·2	1·6	2·1	1·4	16·0	7·3

Such evidence is presumptive of an inferior nutritional status in larger families, since it has been shown that nutritional status is closely related to available income (table II). In order to obtain more direct evidence, an analysis has been made of the nutritional state of Cambridge school-children in relation to size of

TABLE III—NUTRITION AND SIZE OF FAMILY

Number and percentage of children above (+) or below(−) average

School	Height				Weight				Hæmoglobin				Dynamometer			
	Small		Large		Small		Large		Small		Large		Small		Large	
	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−
Senior No. & %	35 (54)	30 (46)	38 (44)	49 (56)	32 (47)	36 (53)	36 (42)	50 (58)	39 (59)	27 (41)	41 (48)	45 (52)	31 (47)	35 (53)	35 (41)	51 (59)
Junior A No. & %	70 (56)	56 (44)	57 (40)	84 (60)	68 (54)	57 (46)	52 (37)	87 (63)	65 (59)	55 (41)	64 (48)	70 (52)	67 (53)	59 (47)	53 (39)	83 (61)
Junior B No. & %	123 (52)	116 (48)	67 (38)	108 (62)	117 (49)	122 (51)	64 (37)	109 (63)	125 (51)	123 (49)	89 (51)	87 (49)	133 (54)	114 (46)	77 (43)	100 (57)

"Small" = children from families with 1 or 2 children. "Large" = children from families with 3 or more children.
Junior school A, in poor area. Junior school B, in better-class area. Senior school, in same area as junior school B.

family. Information was obtained from the parents as to the number and age of members of the family in January, 1943, and this has been related to the results of the nutritional survey on the children carried out in January and February, 1943 (Yudkin 1944b).

The children were from three different schools—two junior and one senior. The children in the junior schools were between 5 and 11 years of age; those from the senior school 12 years (154 children). Junior school A (270 children) was in a poor part of the town while junior school B (424 children) and the senior school were in a better part of the town. (For further details see Yudkin 1944b).

RESULTS OF SURVEY

Size of family.—As might be anticipated, the average size of family of the children from the poorer junior school A was larger than that of children from the better junior school B—the average number of children was 3·10 in the former and 2·61 in the latter. In the senior school, the average number of children was 3·21; the reason for the large size of family in this school is partly that the children were older, so that there was a greater likelihood of their having younger brothers and sisters, and partly that many of the children came from poorer homes than those in junior school B (Yudkin 1944b). The proportion of families of different size is shown in fig. 1.

Nutrition and size of family.—The data reported here concern height, weight, hæmoglobin levels and strength of grip on the hand dynamometer. The relation of other characteristics, physical and mental, to size of family will be described elsewhere.

The effect of size of family has been determined by comparing children from "small" families (one or two children) with those from "large" families (three or more children). The comparison has been made in two ways. In the first, using the average height, weight, Hb or dynamometer reading for each year-group, sex and school, I have determined the proportion of children who are above or below the average, first for children of

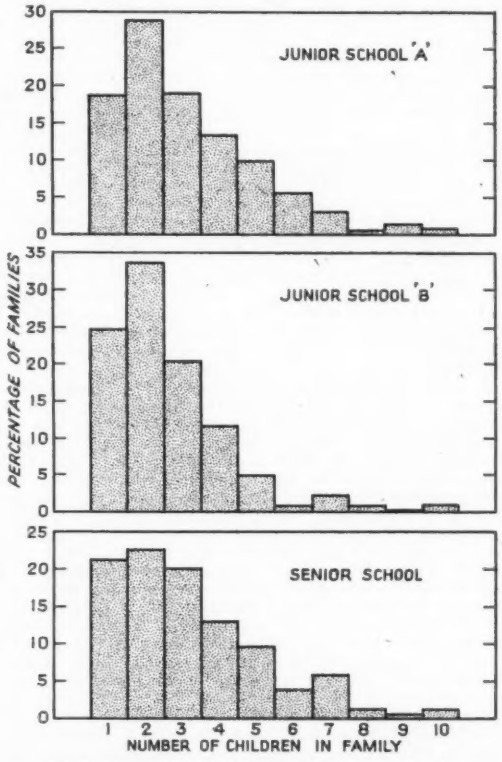

Fig. 1—Distribution of children according to size of family.

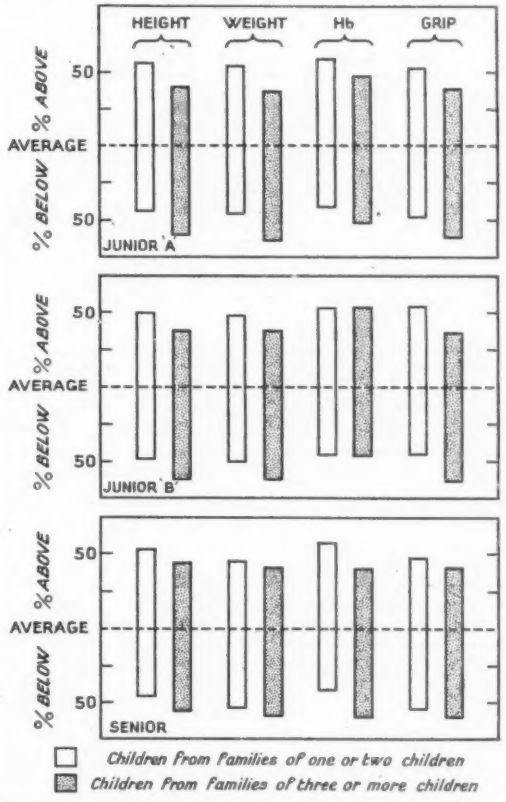

Fig. 2—Proportion of children above or below average, in small families and large families.

small families and then for children of large families. Thus, in junior school A, of the small families, 56% of the children are above average height and 44% below, while of the large families 40% are above average height and 60% below (table III and fig. 2).

It is evident that, in the poorer junior school A and in the senior school, there is a greater proportion of children below average in the large families than in the small, in all four of the measurements made. In junior school B, the same is true for height, weight and strength of grip but not for Hb.

The second way of comparing the children of small and of large families was to compare the average differences in the height, weight, Hb and strength of grip in inches, pounds, percentage and kilogrammes respectively. In this way, it was shown, for example, that in junior school A, children from small families are on the average nearly 1 in. taller, 3 lb. heavier, have a Hb 0·8% higher and a grip nearly 1 kg. stronger, than children from large families (table IV).

In general, the differences between children of small and of large families is greatest in junior school A and least in junior school B. The lesser effect of large families in junior school B in producing children of poorer physique is probably due to two main causes. Firstly, the "large" families are not so large in junior school B as in junior school A. We might therefore expect that the effect of increased size of family would be less noticeable in junior school B. However, the difference in the size of the larger families is not very great; the average number of children in families with three or more children is 4·37 in junior school A and 4·07 in junior school B. This seems insufficient to account for the difference in the effect of family size in the two schools. The second possible cause is the difference in economic conditions of the families from the two areas. Poorer families are clearly more likely to find that an additional child reduces the available income per head below that necessary to provide their minimal needs. Children in junior school A come from poorer families and the reduction of available income with increasing family size is thus likely to affect the nutritional status of these children more than that of children in junior school B.

TABLE IV—DIFFERENCES BETWEEN CHILDREN OF SMALL AND LARGE FAMILIES

	Height (in.)	Weight (lb.)	Hb (%)	Grip (kg.)
Junior school A ..	0·85	3·35	0·84	0·78
Junior school B ..	0·57	1·33	0·14	0·83
Senior school ..	0·52	1·92	1·50	−0·11

Small families—families with 1 or 2 children.
Large families—families with 3 or more children.

Nutritional status, economic status, and size of family.—It has been shown (table V) that appreciable differences in average height, weight, Hb and strength of grip exist between children from the poorer area (junior school A) and those in the better area (junior school B).

TABLE V—NUTRITIONAL STATUS AND SOCIAL CONDITIONS IN ABOUT 800 CAMBRIDGE CHILDREN (FROM YUDKIN 1944B)

	Height (in.)	Weight (lb.)	Hb. (%)	Grip (kg.)
Av. difference between children of better and poorer areas ..	0·8	2·6	2·0	1·3

Now the fact that the effect of family size is greater in children from the poorer area than in those from the better area means that the average is lowered, by children from large families, to a greater extent in the poorer area. A comparison between the two areas of children from small families only would therefore show less difference than the comparison between the averages for all the children. Similarly, if children from the large families only are considered, the differences in height, weight, &c., would be appreciably higher than the differences for children of all families.

An example will make this clearer. Let us take the average weight of all the children at junior school A as x lb. The children at junior school B weighed on the average 2·6 lb more than those from junior school A; that is, their average weight was $x + 2·6$ lb. If we now consider only children from small families, those from junior school A weighed 1·7 lb. and those from junior school B 0·4 lb. more than the average for each school; children from small families at junior school A therefore weighed $x + 1·7$ lb. and those from junior school B weighed $(x + 2·6) + 0·4$ lb. or $x + 3·0$ lb. The difference in average weight of children from small families at the two schools becomes $x + 3·0$ lb. *minus* $x + 1·7$ lb., or 1·3 lb.; this is half the difference of 2·6 lb. in the average weight of all the children at the two schools.

TABLE VI—DIFFERENCES BETWEEN CHILDREN FROM JUNIOR SCHOOL A AND JUNIOR SCHOOL B

Children from—	Height (in.)	Weight (lb.)	Hb (%)	Grip (kg.)
All families ..	0·8	2·6	2·0	1·3
Small families ..	0·4	1·3	1·7	1·35
Large families ..	1·1	3·3	2·4	1·3

The average differences between children of the two schools in height, weight, hæmoglobin and strength of grip, for children of small families and for children of larger families, is shown in table VI. It will be seen that the difference between children from the two areas is, on the whole, decreased, if only children from small families are considered and accentuated if only children from large families are considered.

DISCUSSION

These results may perhaps most simply be discussed in the light of the age-old question of "nature versus nurture." To what extent is the inferior physical state of the poorer sections of the community due to heredity and to what extent to environment? Evidence suggests the importance of environment in determining the health and nutrition of different socio-economic groups (Titmuss 1943). Even within a fairly uniform socio-economic group, nutritional status is much affected by financial differences (Yudkin 1944a). The superior physical state of children from the better area of Cambridge might have been due to genetic differences; but these results suggest that the differences are largely determined by economic causes. Differences in physique between children from the two areas increase as families increase in size; the most reasonable explanation is that the strain imposed by an additional child on the finances of the family is greater in the poorer families.

The social implication of these findings is clear. Except in the wealthier sections of the community, adequate physical development of the children of larger families cannot be achieved within present economic and social conditions. The decreasingly satisfactory economic environment to which later children are exposed can only be avoided by some form of family allowance.

It would not be relevant to discuss here the implications of these results in relation to the question of national fertility, the importance of which is receiving increasing recognition. As Titmuss (1938) says, "It is a trifle incongruous to worry over problems that may arise fifty years hence, before we know how many young lives are being stunted, deformed and wasted *to-day*." Nevertheless, the inability of many families to attain a suitable nutritional standard for more than two or three children, may be partly responsible for the present low reproductive rate. Since it is on the larger families that population maintenance chiefly depends, we must see that the children of such families grow up in conditions favourable to health and well-being. No-one, however anxiously he looks towards a reversal of the present trend in population, would wish it to result in the production of a race of malnourished and inferior beings.

SUMMARY

Cambridge elementary school-children from larger families were on the average shorter and lighter, and had lower hæmoglobin levels and a weaker strength of grip, than children from smaller families.

These differences were accentuated in a poorer area of Cambridge as compared with a better area. It follows that the differences in nutritional state which had been observed between children from the two areas of the town is diminished if children from small families are compared, and increased if children from large families are compared.

The social implications of these findings are evident.

I am indebted to the teachers of the Cambridge schools and to Dr. J. A. Smyth, Dr. Janet Laidlaw and Mrs. Elsie Walton for their collaboration and help in obtaining and analysing the data upon which this paper is based.

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Reconstruction

HOSPITALS IN A NATIONAL HEALTH SERVICE

King Edward's Hospital Fund for London has produced its comments on the white-paper in the form of a memorandum and the following "statement of principles":

A CENTRAL BOARD

A Central Hospitals Board should be established with statutory powers. The amount of work which will have to be done at the centre in connexion with the hospital and consultant services will be very great, and the technical and expert knowledge required very important.

The Central Hospitals Board must be consulted on all important proposals affecting the hospital service before they receive approval.

Full and thorough consideration will have to be given to its size, composition and functions if it is not to suffer the fate of the consultative councils set up when the Ministry of Health was established in 1919. It must be related, on the one hand, to the regional machinery and, on the other, to the inspectorate. The reports of the inspectorate should certainly be referred to the Board, and some of the inspectors [1] should be members of the Board. It should be recognised that those who accept appointment to the Board, whether paid or unpaid, must be prepared to make the work of the Board the primary call upon their time and energy, and must possess among themselves direct personal knowledge of the problems upon which they are called to offer advice. Appointment to the Board should be for a limited period; and the Board should include medical men and laymen with experience of both types of hospital service. The Board would need to be a strong body with its appropriate subcommittees dealing with such matters as finance, planning and administration.

The means whereby the work of the Central Hospitals Board would be correlated with the other health functions assigned by the white-paper to the Central Health Services Council would, of course, require detailed consideration.

REGIONAL AND LOCAL COUNCILS

It has been suggested that for the purpose of hospital services the country should be divided up into some 35 or 40 areas each under a joint authority; these areas would be independent, and any coördination of their work would lie with a central body in London. This would be most unsatisfactory: the standard of work would vary greatly, for notwithstanding visits from inspectors the efficiency in any one area would depend ultimately on the knowledge, ability and enthusiasm of those responsible for the local services. It is essential for the most effective development of the hospital service that areas should be linked together in appropriate groups as indicated in the next section.

Regions.—The country should be divided up into approximately 12 or 14 large regions, and each region should contain a number of areas according to the size of the population. It is very important that wherever possible the region should be based upon a university centre, in order to spread the influence of the university teaching hospitals throughout the country. If the standard of the hospital service of the country is to be raised, it is vital that backward hospitals, both voluntary and local authority, should be brought into close and regular contact with the leading centres of medical knowledge which are to be found in the university cities. Some form of regional organisation affords the only effective means of establishing and maintaining such contact.

For each region there should be a regional hospitals council and attached to it there should be a medical advisory committee. The regional council should be equally representative of the voluntary hospitals and the local authorities. There must be genuine consultation between representatives of the voluntary hospitals and local authorities, and for this purpose they must meet as a common body. Past experience has proved conclusively that the suggestions for consultation proposed in the white-paper have no practical value.

The regional council would need to coördinate the planning of the services of the various areas within the region in the light of the needs of the region as a whole. The regional organisation must also be fully integrated with the central machinery: the reports of the inspectorate must be referred to it: and the distribution of central funds for hospital services must, to a large extent, depend upon its recommendations. Only in this way will there be a real prospect of overhauling the deficiencies of the present hospital system and of establishing a new era of coöperative effort for the common good.

Local Organisation.—Within the region there may be several large cities and other populous areas, and it is important that in each such area there should be machinery for affording the interested parties both voluntary and local authority an opportunity of participating in the planning and development of the hospital services. With this object there should be established in those areas local hospitals councils again comprising representatives of the voluntary hospitals, and of the local authorities concerned. The regional councils should consult the local hospitals councils so far as it affects their respective areas, and the final draft should be sent to them before it is forwarded to the Minister.

It is fundamental to the whole conception of partnership upon which the proposals of the Government are based that the responsibility for the planning of the service should be entrusted at each stage to a body upon which all hospitals are properly represented. Upon the decision of these bodies and not of the local authorities alone must rest, in the first instance, the inclusion or otherwise of particular hospitals within the scheme.

London.—In the case of London, the regional arrangements must cover part or the whole of the area of the Home Counties, however this area may be ultimately defined. It may be that special arrangements will be called for as regards the regional machinery.

Although the size of the area of the authorities remains to be determined, the white-paper contains a hint that it will be necessary to have regard to administrative convenience, and implies that the area of the London County Council will constitute a single authority. The experience of the King's Fund in the Metropolitan Police District proves unmistakably that such an arrangement would only perpetuate one of the primary sources of the maldistribution of hospital facilities in the metropolitan area. In so far as there is a lack of adequate hospital services in the London area, it is to be found on the periphery of London where new populations have sprung up within recent decades—where it has proved difficult for voluntary provision to keep pace with the growth of population, and where the local authority has equally failed to meet the situation. If ever there was a case for coördinated planning, it is over this wide area that transcends the county boundaries.

FINANCE

The level of expenditure upon the hospital services increases year by year. So far the voluntary hospitals have been able to meet this increasing expenditure through patients' payments and the contributory schemes which are their most elastic source of revenue.

1. It was suggested in the course of discussion that the term "inspector" is likely to lead to a wrong interpretation of what is intended, and the term "visitor" or "commissioner" would be preferable. It is to be hoped that the Minister will adopt this suggestion.

They were increasing appreciably before the war and it was confidently anticipated that they would increase at a still greater pace after the war. The Exchequer should accept the responsibility of providing a direct payment related in some way to the requirements of the hospital service: and there should be machinery to ensure that the total amount of the payment can be varied from time to time to meet changes in the level of hospital expenditure.

The appropriate method would be to follow broadly the analogy of the University Grants Committee, and to lay down in advance for a 3- or 5-year period the total annual Exchequer payment. The amount should be determined by reference, not only to the cost of the various grades of hospital but to the requirements of the voluntary hospitals as a whole so far as can be judged in the light of the evidence available from time to time. It should be one of the functions of the Central Hospitals Board to assess the total needs of the voluntary hospitals in the light of the evidence submitted to them by the regional councils, and to recommend to the Minister the total annual Exchequer payment for a triennial or quinquennial period. A provisional sum would have to be agreed in respect of the initial period. Such a plan would afford a reasonable measure of stability.

The hospitals would be graded in relation to their services on the advice of the Central Hospitals Board, and the Exchequer grant paid accordingly. There should be no question of the individual hospitals relying on supplementary grants from a pool to make up deficiencies, since any such plan would undermine voluntary support.

Capital Expenditure.—Where major capital expenditure is required the Government should accept the principle of direct grants from the Exchequer to both voluntary and local authority hospitals on the recommendation as above of the regional councils and after consultation with the Central Hospitals Board.

Contractual Payments by Local Authorities.—All payments for services should come directly from the central Government on the lines already indicated. Any system providing for substantial contractual payments by the joint authorities to voluntary hospitals would place the voluntary hospitals in the long run under the control of the local authorities, and is therefore unacceptable. Even the provision contained in the white-paper that such payments might be "centrally determined" does not remove the probability that where new or additional services are required, the joint authority would prefer to make such provision itself rather than to encourage development of the voluntary hospitals. Such preference is inevitable under any plan whereby additional provision made by voluntary hospitals involves a charge upon the local rates.

A system based on contractual payments by joint authorities to voluntary hospitals would in any case be open to grave objection on the ground that it would tend to restrict the patient to hospital services in the area of the joint authority in which he happened to reside.

In England Now

A Running Commentary by Peripatetic Correspondents

To ring up the blackout curtains has become the symbol of peace for many a British housewife. As grime gathers in their bat-like folds she nerves herself to wait a little longer for the glorious spring-cleaning of the first year of peace. Partial lifting of the blackout will encourage some of the nippier ones to get the things down, washed, and up again between alerts; but most of us, I suspect, will let the dust collect a little longer in these inky trappings. The relaxing of the regulations brought a smile to every face I know, except that of my niece Penelope. "Yes, but the real peace won't be so lovely now," she sighed. I suspect that girl of saving all her parcels unopened until Christmas morning, and otherwise mortifying the flesh. In factories, unfortunately, people won't profit as much as they will in their own homes. Factory blackouts are of the all-or-nothing breed. Skylights and windows are either blacked out permanently or have movable shutters intended not only to keep light in but to keep splintered glass out: curtains are usually to be found only in office buildings. So factory workers at least will taste the full pleasure of transition from all to nothing which Penelope rates so highly. Yet even that will have been diluted by better lighting in the streets and by the comfortable glimmer from their local inn, welcoming them at evening.

* * *

It was twenty past one when the bomb came, and by 5 AM the debris and glass had stopped falling and the heavy rescue squad were at work; only the mess remained, and the water pouring from the damaged roof tank. It was light enough for us to see the extent of the damage and to appreciate the futility of our earlier attempts to disinter two buried patients. One wing of the hospital was out of commission, and much of the other temporarily unusable, so it was obvious that we should have to evacuate the patients. We knew from previous experience the importance of waiting until daylight so that they could have a comfortable journey after breakfast, and we decided to start at 9.30 AM; in the meantime they had to be sorted and the lists completed by 7 o'clock. They were a mixed lot of civilian sick and air-raid casualties, variously ill; some were unfit to move, a few could go home, but the majority must be transferred elsewhere. It wasn't all plain sailing when we went round; yesterday's coronary thrombosis for instance would be better away, but she looked rather ill for the journey. She settled it herself. The old man was at home and none too good, "and that girl will never look after 'im right if I don't tell her—I'll stay, and blast them buzz bombs." Rachel was different, she had paroxysms of tachycardia which made her too weak to walk and she was indignant at the idea of going home. We were firm, but it was no surprise when she turned up, later in the day, with an attack and was readmitted. The children must all go if possible. Fortunately most of them were quietly asleep, under chloral, but one or two had strayed into the soldiers' ward, where they were doing well on an illicit sweet ration. Their hosts of course took advantage of our arrival to apply for leave, but we left that to the Military Registrar, and went on to complete our tour. A hold up was caused by a sudden hysterical palsy which developed as we passed; fortunately the rigid arm soon yielded to manipulation and we left the patient to work out her salvation and to complete the cure in a basin of hot water.

Punctually at 9.30 the EMS Green Line ambulances arrived and we began the work of loading them. Students and light rescue men acted as stretcher-bearers and forced a way through the crowd of sightseers and camera men into the street, while in the wards sisters and nurses supervised the last-minute details that mean so much to the comfort of the sick, and finally checked the clinical notes, ration books and identity cards. Soon the convoy moved off in a steady stream until midday when we made a suitable adjournment. We were well up to schedule and had even added an occasional straggler to the party. Agnes, with congenital hæmorrhagic telangiectasia, was bleeding again and had come up with her husband for her 300th blood-transfusion; she was packed into the nearest ambulance. Two old chronics were scared by a passing doodlebug and came in for examination just in case, but they were soon dispatched on their way. In the afternoon the work went on again with the same smoothness until 5 PM, when we saw the last party of soldiers embus. We had cleared 160 sick in the day.

* * *

A familiar pastime in late Victorian days was a *Confession*, an invitation to contribute opinions respecting your favourite author, your pet aversion, your preference or otherwise for ambidexterity over a taste for olives, and similar tomfoolery. The modern form of such an interrogatory would inevitably be related to the war, and first and foremost, no doubt, selection of the outstanding inconvenience or discomfort. The time is at last coming when we can see them in perspective. The blackout would have little difficulty in establishing pride of place, although by no means without competition from petrol restriction, from the check on certain articles of diet or on alcohol. And I know at least one sufferer who cannot stop talking about his sartorial maladjustments. A coupon life comes hard on a man accustomed to employ thirty pairs of trousers and who never wore the same necktie twice in a month.

To a creature of routine, irregularities and uncertainties of transport have been the major nuisance. A time-sense is a very real thing, a natural possession or a natural deficiency. To order one's life on a system of rigid punctuality may be a dull affair, but it makes for efficiency though it also brings an incapacity to accept disturbances. The autumn blitzes in 1940 exhibited an inconvenient partiality for the big railway stations and especially critical portions of the main lines. To the credit of the railway companies they always got you there somehow, though the regular traveller soon learnt to recognise that every day's journey was an adventure during which preservation of sanity demanded a sense of humour, or rather of the ridiculous. I recall one trip to keep an appointment which involved a walk of two miles, a railway journey of an hour and a half, a bus to another station, an hour in a compartment with 17 other sufferers, a lift on a lorry, another bus, a third railway experience, and finally a mile on foot, always doggedly or obstinately refusing to be beaten with the arrière-pensée of hope that the journey might become quite impossible and one's pride be spared through abandonment. On many days seven hours' travelling were necessary to do two hours' work. Of the danger I say nothing. One started out in the morning speculating at what time one's home and dearest would welcome one's return, never with the reflection that they would never be seen again. Yes, the old-fashioned blitzes had their nasty features, but the beastly flying bombs were still more upsetting. I am not sure that the reason for this was the one generally accorded—the absence of the human element and the inability to hit back. It seems more likely that after five years of war the accumulation of all the weariness, the anxieties and frustrations had lowered our toleration. The statisticians set themselves as usual to comfort us by telling us that the odds against any one person sustaining injury were several thousands, or it may be millions, to one. I do not believe this sort of reasoning helped anybody. When one big hospital is hit four times, stark reality makes a stronger appeal than astronomical figures dealing with coincidences. Cynically one reflects that statistics as applied to individuals are like the attempt to console a convicted murderer: "Only eight people are executed annually in the British Isles out of a population of fifty millions; so the odds against your being hanged are over six million to one. Cheer up!"

* * *

Our George, aged 2½, has provided a side-light on your annotation of Aug. 5, *Ascorbic Acid as a Diuretic*. Except for occasional accidents he had not wetted his bed for many months until last Monday, but he did it then and again on Tuesday, Wednesday and Thursday nights. He also demanded his pot pretty often in the daytime. At Friday's breakfast I said, "How about a round of those vitamin C tablets?" But the bottle was empty. On Monday I had bought 100 tablets of 50 mg. ascorbic acid; the family could account for 20 of them; George had eaten the rest in four days—1000 mg. a day—and Evans's dropsical patients got only 150-300 mg. daily and "diuresis occurred in every case." So watch out for ascorbic acid as a cause of bedwetting.

PSYCHOLOGY OF FRUSTRATION AND FULFILMENT IN ADULT LIFE.—Ten lectures on this subject are to be given at the Caxton Hall, London, S.W.1, on Tuesdays, at 5.30 PM from Oct. 3 to Dec. 5. The speakers are as follows: Dr. Edward Glover (Oct. 3), Miss Anna Freud (Oct. 10) the psychoanalytic approach; Prof. J. C. Flugel, D SC (Oct. 17), the married man; Dr. R. G. Gordon (Oct. 24) the celibate man; Miss Lloyd-Baker, JP (Oct. 31), the celibate woman; Dr. Winifred Rushforth (Nov. 7) the married woman; Principal J. H. Nicholson (Nov. 14) coeducation of young adults; Rev. A. Herbert Gray, DD (Nov. 21), parenthood; Dr. H. Crichton-Miller (Nov. 28) frustration and authority, (Dec. 5) evolution and fulfilment. The series will be repeated at Friends Meeting House, Bull Street, Birmingham, on Wednesdays at 5.30 PM from Oct. 4 to Dec. 6, when Dr. Lois Munro will take the place of Miss Freud, Dr. C. L. C. Burns the place of Professor Flugel, and the Rev. M. R. Ridley the place of Principal Nicholson. Tickets for either series may be obtained from the National Council for Mental Hygiene, 39, Queen Anne Street, London, W.1.

Letters to the Editor

EXECUTIVE CONTROL IN A NATIONAL HEALTH SERVICE

SIR,—Sir Ronald Davison in his letter of Sept. 2 raises a constitutional issue when he states that the white-paper sets out a democratic solution of the problem as to what body is to have executive control of the new National Health Service.

I speak first with the prejudice of a doctor. I believe and I fear that the proposals contained in the white-paper will lead to state control of the medical profession. The reason for this fear is the statement on p. 29: "All doctors in general practice who join in the new relationship with their patients, and rely largely in future on public funds for their normal livelihood, must be treated on a similar footing; the terms of their remuneration, the general conditions to be observed by them, and the rights to be enjoyed by them, must be nationally negotiated and settled." Although there is no compulsion to join the new service the great majority of doctors will inevitably do so, and they will become civil servants. As Sir Ronald says, every effort will be made to meet reasonable demands for professional freedom, but whatever effort is made it is obvious that neither professional nor personal freedom is compatible with the efficient conduct of a service. Sir Ronald and I, who have both spent some years in a service, know this.

But I speak also with the prejudice of a democrat. The essential feature of a democratic state is the existence of organisations having authority independent of the state. The relative independence of such organisations, as for instance the Church and the medical profession, depends on all organisations, including the state, being subject to the law and not subject to the state.

The white-paper proposals are the first step to the control of our present independent organisations by the state. It is the first step towards National Socialism when the state takes control of the medical profession. We have seen the last step taken by Adolf Hitler when he made the law subject to the state. The use of the word "junta" by Sir Ronald for the description of Mr. Phillips's administrative council would suggest to a psychologist that he is imbued with Continental ideology, because the OED's definition of the word is "with reference to Spain or Italy: a deliberative or administrative council or committee."

Lastly Sir Ronald says that we doctors will be thankful that there is a Minister of Health to take final responsibility for a service which so intimately touches the lives of all our citizens. I think this is true to a certain extent, because we doctors carry a heavy responsibility, and some of us might like to share it with the state. But will our patients be thankful? It may be noted with some interest in this connexion that the report of the Committee on Training for the Civil Service (chairman, Mr. Ralph Assheton) referred to "the need for Civil Servants to acquire the right attitude of consideration and sympathy towards members of the public." And it further remarked that "the Civil Servant must never forget that he is the servant not the master of the community, and that official competence need not, and should not, involve the loss of the human touch."

I seriously warn laymen (Sir Ronald Davison speaks for laymen), and it is a sincere warning, if we are made civil servants we doctors may lose the human touch. We shall risk becoming the "robot-like, mechanically efficient Service" referred to by the committee of the Treasury.

London, W.1. GEOFFREY EVANS.

SIR,—Your publication (Sept. 2) of extracts from the broadcast discussion is of great value, for it allows us to analyse carefully the civil service point of view. Sir Arthur Rucker states that the responsibility for managing a national service, provided out of the people's own money, "can't be just handed over to an organised profession or otherwise." But what about the Navy, Army and Air Force? Clearly Sir Arthur is wrong. No-one from Parliament downwards objects to the experts of the three fighting services managing their services. Again, Sir Arthur objects to a Board of

Medicine because it would presuppose that all doctors were direct servants of the state under strict discipline. Few people will accept this point of view. In the Navy all equipment has been paid for by the state and the sailors have been trained at the expense of the general public. In the proposed National Health Service, the Government will make use of the voluntary hospitals and take over the medical and nursing personnel for whose training they have paid little. Surely the profession and the voluntary hospitals have more right to insist upon executive control than the fighting services?

Our profession must understand clearly that the civil servants will fight tooth and nail to obtain executive control of the National Health Service. If they do, the future of medicine in this country is little short of appalling. At the moment there are doctors from all sorts of countries over here and their opinion of the white-paper is frankly contemptuous and invariably tinged with ridicule. After the war we must use all our resources with maximum efficiency to retain our position amongst the Great Powers. My talks with foreign doctors have convinced me that the white-paper plan has created a very bad impression and their opinion should not be ignored.

A wonderful opportunity was offered to the framers of the white-paper. It was possible for them to weave together all the medical services and training centres to produce a service of which this country could be proud, yet unless their proposals are drastically reformed the opportunity of centuries will be lost. In my view the white-paper proposals are quite unworkable without friction and discontent. A Board of Medicine should have executive control at the top and I have already outlined a scheme (*Brit. med. J.* June 17 Suppl., p. 147). The Department for Hospitals and Supply which I suggested, together with its regional and local committees, corresponds fairly closely to the suggestion of the British Hospitals Association scheme of administration. The Department of Teaching and Research would administer all the proposals of the Goodenough report.

Bradford-on-Avon. WILFRED SHAW.

SCARLET FEVER WITHOUT HÆMOLYTIC STREPTOCOCCI

SIR,—A small boy (M. A.), aged 2½ years, was admitted to an isolation hospital on March 18, 1944, suffering from measles. On the same day, his father (S. A.), aged 34, who was employed away from home by the NFS, returned in view of his son's illness.

On March 27—9 days after the father's return, I was called in, as a medical officer of health, to see his wife (C. A.), aged 37, because her medical attendant was of the opinion that she was suffering from scarlet fever, with headache, sore throat, general punctate rash and Pastia's sign, but in view of the diagnosis of M. A. thought a second opinion would be advisable.

In my view, C. A. was a well-defined clinical case of scarlet fever, and accordingly she was admitted to the isolation hospital on the same day. As a matter of interest, I swabbed her throat and ascertained from her husband that he had been suffering from a sore throat since he arrived home, and was attending another local doctor for tonsillitis. As he had not been swabbed, I took a swab of his throat at the time of my visit.

The results of these swabs are interesting. The wife (C. A.), who had clinically typical scarlet fever, confirmed by the medical officer in charge of the isolation hospital, with subsequent scarlet fever desquamation, produced a negative swab, as reported by the Ministry of Health laboratory concerned. A further swab, taken on admission to hospital, was also negative. The husband (S. A.), on the other hand, produced a profuse growth of hæmolytic streptococci which persisted until April 24 without showing any evidence whatsoever of scarlet fever other than a sore throat. Neither C. A. nor S. A. had any previous history of scarlet fever.

Incidentally, throughout the period of S. A.'s stay at home, there was another child (B. A.), aged 6½ years, who was also swabbed on March 27 with a negative report respecting hæmolytic streptococci. He developed neither measles nor scarlet fever and had no previous history of either.

From an administrative point of view, it would appear that S. A., with his tonsillitis and profuse growth of hæmolytic streptococci, who was unnotified as scarlet fever, was a greater potential danger to the community than his wife. At no time did he develop any other signs or symptoms of scarlet fever and he returned to duty soon after April 24. His wife was discharged without any complications from the isolation hospital on the 19th. The small boy, M. A., who had been discharged on April 1, had no previous history of scarlet fever but did not contract the disease.

The point I wish to make in recording these events is that it is generally agreed that hæmolytic streptococci can almost invariably be isolated from the throat and nose in ordinary cases of scarlet fever and a negative result is strong presumptive evidence against the diagnosis. The case of C. A. appears to provide a clear-cut exception to this rule. I am aware that a negative result may be due to the presence of some other common organisms, which in culture might overgrow the hæmolytic streptococci present and so obscure their colonies; but it would be strange if that occurred on two different occasions in two different places within 24 hours, when the swabs were correctly taken. The moral of this story is to accept the backing of your clinical opinion in such circumstances, with all due respect to the bacteriological reports.

Hadleigh, Essex. N. S. R. LORRAINE.

PNEUMONIA IN SMALLPOX CONTACTS

SIR,—The article by Major Howat and Colonel Arnott in *The Lancet* of Sept. 2 has raised a very interesting issue in relation to virus infections—Was the pneumonitis a modified form of smallpox in vaccinated persons, or was it due to an associated virus? An important point lies in the exact incubation period. I have myself suffered from variola sine eruptione due to contact, lasting a few hours, with several cases of a severe type of smallpox, and the incubation period was exactly 12 days. The information given by Howat and Arnott is not quite sufficient to tell us whether the time of development of symptoms was compatible in each case with an incubation period of 12 days. Perhaps this information is available in their records. Of course, in nursing orderlies the period of contact would be prolonged, but it might be that one or more of the orderlies had only a limited period of contact, enabling the more precise determination of the incubation period in such a case.

In cases of hæmorrhagic smallpox there is often evidence of pulmonary lesions with incessant cough. In my experience such pulmonary symptoms develop early in the prodromal period. It may be that a pneumotropic variation of the virus exists, possibly as a mutant, just as there may be a neurotropic variant. The determination of the incubation period might well act as a pointer to whether it was a variant of the variola virus or some superimposed virus infection that was operative in this outbreak.

Liverpool. C. O. STALLYBRASS.

SEVERE REACTION TO MONOETHANOLAMINE OLEATE

SIR,—'Ethamolin' and 'Neo-Varicain' solutions are widely used in the sclerotic treatment of varices but severe allergic responses to their injection, as in the following case, are rare.

A healthy woman had received three weekly doses of a proprietary brand of monoethanolamine oleate with completely satisfactory results. Small varices were under treatment and not more than 1 c.cm. was given at each attendance. At the fourth attendance 0·5 c.cm. was given into a small vein in the neighbourhood of the ankle. Within two minutes the patient became deeply unconscious, grey, cyanosed and pulseless. The pupils were widely dilated, and urine and fæces were voided. Consciousness returned within ten minutes of giving adrenaline (1-1000) minims 15, followed by nikethamide and routine measures for shock. Severe precordial pain then occurred and it was several hours before the pulse could be felt at the wrist. Twenty-four hours later the patient had returned to normal.

Monoethanolamine oleate is capable of producing death (Shelley, H. J. *J. Amer. med. Ass.* 1939, **112**, 1792) or dangerous collapse, but the chances of

these complications are very small. I had personally given some 1500 c.cm. of this solution in the previous year and had never seen anyone the worse for the drug. Sodium morrhuate is in the opinion of many a dangerous agent, since fatalities and collapse have frequently been seen. S. R. Truman (*J. Lab. clin. Med.* 1942, **27**, 586) investigated the antigenic properties of monoethanolamine oleate, showing that this substance gave a negative reaction to protein by the Greenberg method for total protein. He was able to show death from anaphylaxis in guineapigs when sodium morrhuate was used, but formed the opinion that monoethanolamine oleate was not a sensitising antigen for any of the animals tested. However, as this case demonstrates, the small risk of severe collapse is present whenever the monoethanolamine type of solution is employed. For this reason adrenaline should always be available, and this should be given direct into a varix, if speed of action is desired.

Harley Street, W.1. R. R. FOOTE.

GERMANY TOMORROW

SIR,—In your first editorial after the beginning of the armed conflict with Nazi Germany you urged that we should strive to keep in view the hope that it would end with "a peace of understanding." You also suggested that those members of our profession whose business is with the aberrations of human mentality might be able to give some help towards this end.

Many able psychiatrists are at the whole-time disposal of the Government, and it would be strange if they were not employed in the care and control of the more extreme cases of personality disorder among the German prisoners; such cases as those of German youths who prefer to die in conformity with the creed of hatred and destruction which almost from their earliest memory they have been conditioned to accept, rather than to face the mental distress involved in a complete revision of the values by which they live.

But, assuming that those showing extreme hostility are to be handled according to the principles governing the treatment of such cases in the best of our mental hospitals, we have still to deal with the larger problem presented by the whole German people. The great majority of them are believed to have been until quite recently hoping fervently for a Nazi victory. One can hardly even begin to assess the total effects of Nazi propaganda, air bombardment, losses of life among their soldiers and civilians, frustration and other sufferings yet to come, but we can be sure that the task of forming a healthy mutual relationship between the occupying and relieving authorities and the conquered people will be one of extreme difficulty.

The purpose of this letter is to draw attention to an assumption which increases this difficulty, and which I believe to be false: the assumption that the people of Germany, and of any other "civilised" country, must be held responsible for the opinions which they hold sincerely and upon which they act. In the early days of the war many observers in this country made a distinction between the German people and their Nazi rulers, on the ground that great numbers of the former disapproved of Nazi policies and methods, and would repudiate them if they could. The later reports from inside Germany which seemed most reliable discredited this as "wishful thinking"; they were unanimous in saying that the great majority of the people of Germany were sincere and even fanatical supporters of their Führer, and the opinion grew here that the German people were, with few exceptions, equally guilty with their rulers for the abominations of Nazidom.

Direct observation of the political conduct of our own people seems to indicate that about 5% examine the alleged facts and premises with some sort of critical judgment before forming an opinion; they are of course influenced by suggestion and emotion, and find it easier to believe what "everybody" amongst their associates believes, but they put up a defence against purely emotional decisions. They are accessible to propaganda based upon facts and reason or upon skilful counterfeits of these, but require at least some plausible excuse for their conclusions; and in conditions of civil freedom they are ready to accept some responsibility for them. The other 95% form their opinions entirely by suggestion from others. Whatever these may be, so they remain so long as life flows comfortably. If things go wrong, they are supported by one another's agreement in feeling that something ought to be done, and become interested in the views of acquaintances belonging to the 5% first mentioned, who are thus in a position to dictate the nature of the change. The 95% want only to live a quiet life, free from responsibility; they have no ambition to be leaders or to coerce their neighbours, and even in a free democracy where their votes have considerable influence they find it impossible to take their responsibility seriously.

In conditions of real freedom the 5% are responsible for any change in political opinion; if they are for the most part in agreement amongst themselves the 95% go with them, and this is true also if they are captured by propaganda. If, as has been the case in Germany, there were a serious difference within the 5%, but all except one faction were coerced into silence, the 95% would have no option but to accept the views of those whom they could hear.

There is no reason to doubt that the percentage of the politically passive is approximately the same in Germany as here, and if this is so it follows that the mass of the German people must by now hold the opinions which their dictators wish them to hold. They themselves have no responsibility for their shape, nor could they have refused to adopt them.

If this analysis is accepted, it follows that those who approach Germans with the most benevolent intentions must expect to be received often with hostility which cannot immediately be overcome, though it can be increased by any counter-hostility. But an understanding of the position should make it easier to persist patiently with a benevolent attitude. What is perhaps more important, it points the way to the re-education of the German masses. We must seek out these remnants of the 5% who have never abandoned an anti-Nazi atittude and yet have escaped destruction, supply them with well-authenticated factual information, and give them every facility to make their voices heard. At the same time we must take the responsibility of silencing their pro-Nazi opponents, with every apology for this denial of the freedom of speech, and every possible guarantee for its restoration at the earliest possible moment, when the balance disturbed by Hitlerite persecution has been redressed.

London, W.1. J. NORMAN GLAISTER.

EXTROVERSION OF THE SPLEEN

SIR,—A case of some interest recently passed through my hands on the Burma front. An enemy mortar bomb hit a truck on the road nearby and an Indian Sepoy was brought into my ADS within a few minutes. He was suffering considerably from primary shock, though not unconscious, and lay partly curled up on his right side. Examination revealed a splinter wound of the forearm and a gash 4–5 inches long in the left loin, rather high up posteriorly, probably overlying the eleventh rib region. Through this almost the entire spleen was protruding, lying on the skin like the head of a mushroom. There was a deep laceration about 3 inches long on it. There had been considerable hæmorrhage, though whether from spleen, loin wound or arm it was impossible to say. On admission hæmorrhage had ceased. The protruding spleen was covered with large gauze pads soaked in warm saline and masses of cotton-wool. A drip plasma infusion was started and continued during evacuacior in 3-ton truck. He was evacuated within an hour and reached CCS some two hours later. There he was found to be in fairly good condition and was operated on. The spleen was then seen to be protruding through the *chest-wall* via a hole in the diaphragm. Presumably a violent effort at the time of wounding had increased the intra-abdominal pressure and forced the spleen through the wound, the diaphragm then contracting down on the pedicle and preventing fatal hæmorrhage. Splenectomy was performed, and when I saw the man ten days later he was alive and doing well.

To my surprise I heard of an exactly similar case a few weeks later from a MSU in the area. Apart from that I have never read or heard of such an injury.

R. A. BURN.

FIXED TRACTION IN A THOMAS

SIR,—Mr. Bankart in his letter of Sept. 9 has failed to grasp the argument. It is a poor denial to confound a mathematical demonstration with a simple statement that it is wrong. It surely requires that some fallacy should be pointed out.

I accept his "elementary indisputable" facts, and if he will read again my article he will see that I do not attempt to explain them away by mathematical formulæ. No mathematician would ever be foolish enough to do this. What I did demonstrate was that the pressure of the splint on the tuber ischii could be lessened, whilst the principle of fixed traction is preserved.

He says "pressure on the tuber ischii can be relieved only by pulling the splint away from it." Agreed. A glass full of water standing on a table exerts less pressure on the table when half its contents is removed. Here again the compressed bottom of the glass expands and the tumbler moves upwards. But in each case the movement is negligible, and contact between the splint and tuber ischii or glass and table is maintained.

I did not refer to the forces coming into play owing to the suspension of the splint because I did not want to complicate the proof. He says "If the splint is suspended by a vertical force, this force will balance the weight of the splint (and limb) and it will have no other effect." There is a glaring mathematical error here. If ϕ be the angle between the vertical cord and the part of the splint proximal to the cord there will be a force W cos ϕ pulling the splint away from the tuber ischii where W is the tension of the cord. Here the angle ϕ being oblique the cosine is negative. If the angle ϕ be acute there will be a pull forcing the splint against the pelvis. If the cord be at right angles to the splint cos ϕ becomes 0 and there is no pull either way along the splint. Hence there was no necessity to drag this force into my argument. I have frequently pointed out these facts to my house-surgeons.

If Mr. Bankart would try the method I advocate, I believe he would find the difficulties and drawbacks not so serious as he is disposed to think.

St. Mary's Hospital, London. CHARLES A. PANNETT.

CHOOSING THE STUDENT

SIR,—To psychologists working on problems of vocational selection and allocation, the article by Dr. Edholm and Dr. Gibson, in THE LANCET of Aug. 26, on the relationship between intelligence-test scores and examination results of medical students, is both interesting and controversial. The use of examination marks in the preclinical subjects as the sole criterion of capacity is questionable. The real aim of selection is to produce good doctors rather than good examination candidates. Useful psychological tests would predict the eventual satisfactoriness of the doctor, rather than his success in examinations. Some proficient examination candidates prove to be indifferent doctors, and a fair proportion of discouraged but persistent examinees ultimately become valuable members of the medical profession. It is true that personal assessments made on the students' clinical work would be still more subjective than are examination results. However, this subjectivity might be minimised by obtaining two or more assessments from different clinical teachers. A comparison of the relationship between the potential doctor's general satisfactoriness and (*a*) examination results, (*b*) test scores, might prove illuminating.

In table I of their article, Edholm and Gibson give the median score for students in 1942 as 54. This figure is incompatible with the frequency distribution given, 67% of the students having obtained less than 54 marks, and with the mean score of 52·5. This throws some doubt on certain of the conclusions drawn in paragraph 1 of the "Discussion." No data are adduced to indicate that the "high mental ability of the average medical student" is any higher than that of other students. Furthermore, in 1942, the scores of 14% of the medical students are below the mean for an unselected group of adults, as given by Raven.

With reference to the second paragraph of the discussion, it is perhaps worth pointing out that the Matrix is a strictly non-verbal test, and as such can (unlike NIIP Group Test 33, used by Inkster) scarcely be said to assess "precision in the use of words." "Initiative and curiosity" may well be related to intelligence but little is known at present of the existence or extent of this relationship. Group Test 33 and the Matrix, like most if not all intelligence tests, measure analytical and deductive, rather than creative and organising, abilities.

To determine the value of psychological tests as an aid to the selection of medical students, experiments should be carried out with tests of different type and perhaps of different grade. It is possible that a test specially devised for a highly selected population, such as students, would have greater predictive value for them than one which has proved itself valid in assessing members of an unselected group, and which produces "bunching" at the top end, as does the Matrix.

On the other hand, it may be that, granted a reasonable minimum of general intelligence (above that of Inkster's tail of eight students, quoted in *Choosing the Student*, vide supra), the excellence of a doctor is dependent on his temperament and character, and specific aptitudes and interests. Considerable further research is required to determine the desirability of using psychological tests in the selection of medical students, and the best test or battery of tests for that purpose.

A. W. HEIM.
Psychological Laboratory, Cambridge. N. TIMPANY.

UNSUSPECTED TUBERCLE

SIR,—Dr. Brailsford in your issue of Sept. 2 calls attention to a danger of which practitioners interested in tubercle have been aware for many years—namely, cases of pulmonary tuberculosis which have been radiographed many months before coming under treatment. The reason for the delay has been an expression of opinion by the radiologist that "the disease is inactive," giving a false sense of security. Perhaps if the radiologist would qualify his statement by suggesting confirmation by sedimentation-rate, sputum examination and reference to tuberculosis officer or other competent physician, some of these cases would come under treatment at an earlier date, and some of the contacts would be saved from infection.

Harley Street, W.1. E. H. HUDSON.

INTRA-ORAL SPLINT FOR FACIAL PALSY

SIR,—The description by Allen and Northfield (*Lancet*, Aug. 5, p. 172) of their appliance for supporting the angle of the mouth should help to bring this form of treatment to more general notice. Their condemnation of the external sling is fully justified. The hyperextension of the sphincter-like orbicularis oris which results must be emphasised. I feel however that the appliance should be so shaped as to provide adequate support of all the facial tissues. This can be achieved by continuing the intra-oral portion upwards and backwards in the buccal sulcus. Careful moulding of a wax pattern will permit of support of all the tissues in front of the malar buttress without ulceration, and show great improvement in the facial appearance.

The form of attachment can also be modified. While I admire the twin tube device, I consider that this can be obviated by employing a removable rather than a cemented splint. This is satisfactory if constructed with retentive devices as in partial denture work, particularly when direct casting is employed, and whenever possible should be clear of the bite. Such a removable splint is more hygienic than a cemented splint in those cases in which support may be required for long periods. A partial denture should, of course, be used whenever possible. I have used such appliances in this unit, both attached to a splint and fixed to a partial denture. The latter carried in addition a flange for correcting deviation due to traumatic loss of the mandibular condyle at the time of the nerve lesion.

I was surprised that a base-plate was used for edentulous cases. The stability of an upper denture is greatly improved by a correct bite, and, if the cost precludes the provision of teeth, acrylic bite blocks can be employed and the dental function correspondingly improved.

Plastic and Jaw Unit, EMS Hospital. B. W. FICKLING.

On Active Service

CASUALTIES

The following casualties have been announced :

DIED

Captain BENJAMIN DAVID BERGER, MRCS, RAMC
Major CHARLES PETER MANN, MB ABERD., RAMC
Wing-Commander WILLIAM MILLIGAN, MB LEEDS, RAFVR

WOUNDED

Lieutenant I. G. D. BELL, MB DURH., RAMC
Colonel R. D. CAMERON, MC, MB EDIN., RAMC
Lieut.-Colonel G. C. DANSEY-BROWNING, MRCS, RAMC
Captain T. S. MAW, MB ST. AND., RAMC
Captain W. J. MORRISSEY, RAMC
Captain G. M. SINCLAIR, MB ABERD., RAMC

AWARDS

C B E

Brigadier STANLEY ARNOTT, DSO, MD EDIN., late RAMC, has been appointed CBE in recognition of gallant and distinguished services in Italy (corrected notice).

GM

Flight-Lieutenant A. G. SPENCER, MB LOND., RAFVR

One day in February, 1944, an aircraft, carrying a 500 lb. bomb and incendiaries, crashed near a Royal Air Force Station and immediately caught fire. A gunnery instructor was soon on the scene and, despite the great heat and exploding ammunition, he attempted to rescue the crew. Shortly afterwards he was joined by Flight-Lieutenant Spencer, the station medical officer. The wreckage was blazing from end to end and several times these officers were compelled to break off their rescue attempts. The instructor entered the burning aircraft four times with a handkerchief tied round his nose and mouth. At the fourth attempt he was driven back by the heat and flames, his eyebrows being burnt off and his right trouser leg and pocket burnt. Flight-Lieutenant Spencer stayed close at hand and searched in the wreckage for possible survivors. It was not until the bombs were red hot and Spencer was certain that the crew must be dead from the heat that these officers abandoned their efforts. They then warned the fire party to withdraw and cleared the area of spectators just before the 500 lb. bomb exploded.

MEMOIRS

Wing-Commander WILLIAM MILLIGAN was born in 1902 and studied medicine at the University of Leeds where he graduated MB in 1927. After holding a house-appointment at the Hospital for Women and Children, Leeds, he settled in general practice at Driffield. In 1937 he was commissioned in the medical branch of the RAF volunteer reserve, and after his embodiment for war service in 1939 served at various stations at home till in 1943 he was posted to command a station hospital. When Wing-Commander Milligan died on Sept. 3 he was serving at a RAF headquarters overseas.

Squadron-Leader JOHN GAUVAIN was the younger son of the late W. P. Gauvain and Mrs. Gauvain of Tadworth, Surrey, and a nephew of Sir Henry Gauvain. He was born in New Zealand in 1915, where his father was then consulting engineer. At the age of four he came to England and was educated at Stowe, where he was head of Grenville House and school prefect, and at Clare College, Cambridge. He took his medical course at St. Bartholomew's Hospital, but after qualifying MRCS in 1939 he declined a house-surgeoncy there and joined the RAFVR on the outbreak of war.

Portman Press Bureau

The following year he graduated MB, and in 1943 was mentioned in dispatches. Later he was posted to the Middle East where he was fatally injured in an aeroplane crash in the desert last month. Gauvain was particularly interested in medical problems associated with flying, and his future was of great promise. He was a good sportsman and endeared himself to all. He leaves a widow and three children, the youngest of whom he had never seen.

Captain ALEXANDER RAMAGE, who died at the age of 29 from wounds received in Normandy, was educated at Dollar Academy and St. Andrews University where he graduated MB in 1938. After holding a house-appointment at Longton Hospital, Stoke-on-Trent, where his wife Miss Ida Horrobin was a member of the nursing staff, he became an assistant medical officer at Oldchurch County Hospital, Romford. In 1941 he joined the RAMC and for three years had been RMO to the field regiment of an armoured division. Outstanding at all games Ramage was captain of his university soccer club. He leaves his widow with two young children.

Notes and News

ANOTHER CHAIR IN CHILD HEALTH

CARE of children fills a great part of the family doctor's time, so it is fitting that opportunities for adding to his knowledge of this part of his work should be provided generously. That this principle is becoming widely accepted is evident from the number of new chairs of children's diseases or, better, of child life and health, now being created. The appointment of Dr. Norman Capon to the new Liverpool chair was announced recently,[1] and London University now follows the examples of Glasgow, Edinburgh, Durham, Leeds and Liverpool. The Nuffield Foundation has allocated £10,000 for ten years to London University for the founding of a chair of child health. A postgraduate institute of child health is to be created, associated with the Hospital for Sick Children, Great Ormond Street, and the obstetric department of the British Postgraduate Medical School. Here it will be possible to conduct teaching and research on all aspects of child health, thus adding an important branch to the postgraduate education already undertaken by London University. The institute, it is hoped, will adjoin the Great Ormond Street hospital. The site and buildings may cost as much as £250,000, which has yet to be found.

The Nuffield Provincial Hospitals Trust contributed to the University of Durham chair in child health at Newcastle-on-Tyne, and lately the Trust has also made a grant for research on infant diebetics and on problems of neonatal and infant life, to be carried out in the department of child life and health of Edinburgh University. This grant will first be made for an experimental period of three years. Research will be directed by Prof. Charles McNeil who holds the chair. In view of this new project, it is worth recalling that Edinburgh was the first university to put the emphasis on health rather than disease in the title of its professor. Research on these lines, it is hoped, will have practical results which can be used in the training of medical students, pupil midwives and health visitors, and which will raise the general standard of health among infants and reduce their mortality.

The Midwives Roll

At the end of March there were 68,859 names on the roll kept by the Central Midwives Board, 1747 more than a twelvemonth earlier; but only 16,071 had notified their intention to practise during 1943. The summary report of the CMB, which has just been circulated, indicates however a slight remission in the shortage of practising midwives, inasmuch as practically all the 1169 women who qualified between Sept. 1943 and March 1944 were required to practise. The median age of practising midwives is 38-39, and some 70% of the total are between the ages of 27 and 47. Nearly 56% were general trained nurses at the time of enrolment. In the twelvemonth under review 3403 pupils began part I and 1698 began part II of their training, an increase of 329 and 37 on the previous year. Some 2400 midwives have now qualified to give gas-and-air analgesia. Only 2 names were removed from the roll during the year for negligence or misconduct.

Hospital Saving Association

The association has started a new scheme for those whose income exceeds £420 a year. The original class A members, who are all compulsorily insured or in the under £420 income-group, will continue to contribute at the rate of 4*d*. a week. For the new class B members the rate has been provisionally fixed at 7*d*. a week. This will entitle them and their dependants to the reimbursement of hospital bills (up to a maximum of 15*s*. a day for 70 days), to grants for diagnostic services and for courses of special treatment. Grants for dental treatment will also be made to contributors, but for these dependants are not eligible. Further information may be had from the secretary of the association, 30, Lancaster Gate, London, W.2.

1. *Lancet*, Sept. 2, p. 332.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty held on Sept. 4 with Dr. James MacDonald, the president, in the chair, Dr. R. Y. Keers (Murtle, Aberdeenshire) was admitted to the fellowship *qua* physician, and Mr. Robert Mailer (Glasgow) *qua* surgeon.

U.S. Public Health Consultants

With the advances of Allied forces into occupied territory, military responsibility for the health of civil populations in liberated countries in Europe and the Far East will increase, and the Surgeon-General of the United States Army has appointed the following civilians as his consultants in preventive medicine and public health:

GEORGE K. STRODE, MD, director of the international health division of the Rockefeller Foundation.

C.-E. A. WINSLOW, Dr.Ph, Lauder professor of public health, Yale School of Medicine.

HUGH H. SMITH, MC, regional director for United States, Canada and Mexico, International Health Division, the Rockefeller Foundation. For the past three years Dr. Smith has represented the Foundation in England, where he has worked with the Ministry of Health.

ERNEST L. STEBBINGS, MD, commissioner of health, New York City, professor of epidemiology (on leave), DeLamar Institute of Public Health, Columbia University.

ABEL WOLMAN, PH D, professor of sanitary engineering, the Johns Hopkins School of Hygiene and Public Health.

CLAUDE E. FORKNER, MD, director of the China Medical Board. Dr. Forkner has recently returned from a year's assignment in China, where he has been adviser to the committee on medical education of the Ministry of Education of China. While in China he was also professor of medicine at the National Central University and the West China Union University, Chengtu, China.

British Social Hygiene Council

A regional conference on population problems will be held at the National Museum of Wales, Cardiff, on Friday, Sept. 29. At the morning session, which will open at 10.45 AM, Mr. D. Caradog Jones, D SC, and Prof. H. A. Marquand, D SC, will speak on present prospects, and at the afternoon session, at 2.30 PM, Group-Captain J. A. Cecil Wright, MP, Lady Rhys-Williams and Dr. T. L. Scott will make a plea for a plan. The secretary of the conference is Dr. J. Greenwood Wilson, Public Health Department, City Hall, Cardiff.

Cancer Research at Sheffield

The Nuffield Provincial Hospital Trust have made a grant to the Sheffield Radium Centre for the salary and expenses of a biochemist who is to work in the Sheffield Cancer Laboratory, which has been maintained by the Yorkshire Cancer Council for the past fifteen years, under Prof. H. N. Green, the director. The new worker is to study the effects of radiation on biochemical processes in normal tissues and his immediate problem will be to determine whether small doses of radiation stimulate hyperplasia of specialised cells, by studying the excretory rate of sex hormones after irradiation of the gonads.

Tuberculosis Association

The annual general meeting and conference of the association will be held at the London School of Hygiene, Keppel Street, W.C.1, on Thursday afternoon, Oct. 12, at the County Sanatorium, Harefield, on Friday, and at Manson House, Portland Place, W.1, on Saturday morning, Oct. 14.

On Thursday, Sept. 21, at 3 PM, at 28, Portland Place, London, W.1, Air-Marshal Sir Harold WHITTINGHAM will address the Royal Institute of Public Health and Hygiene on aviation's contribution to preventive medicine.

The Minister of Health has extended for a further twelve months—i.e., till March 31, 1946—the period allowed to local authorities under the Cancer Act 1939 for the preparation of schemes providing expert diagnosis and skilled treatment for their cancer patients.

SURGICAL CORSETS.—Two medical certificates will no longer be required for the supply of surgical corsets. Manufacturers may now supply a corset, free of style and quota restrictions, on the production of a single medical certificate stating the condition from which the patient is suffering; the list of approved conditions covers most of the cases likely to require a surgical corset or belt, and the Board of Trade will consider the claims of other cases on receiving a full medical certificate. There is still no change in the anomalous position that two clothing coupons must be surrendered for surgical belts more than 6 in. wide, but not for narrower belts. The coupon requirement has the absurd effect of reducing the clothing allowance of one class of sick persons.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED SEPT. 2

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1137; whooping-cough, 1389; diphtheria, 445; paratyphoid, 13; typhoid, 10; measles (excluding rubella), 1069; pneumonia (primary or influenzal), 297; puerperal pyrexia, 132; cerebrospinal fever, 27; poliomyelitis, 25; polio-encephalitis, 7; encephalitis lethargica, 1; dysentery, 419; ophthalmia neonatorum, 59. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on Aug. 30 was 690. During the previous week the following cases were admitted: scarlet fever, 19; diphtheria, 6; measles, 22; whooping-cough, 13.

Deaths.—In 126 great towns there were no deaths from enteric fever or measles, 1 (0) from scarlet fever, 5 (2) from whooping-cough, 4 (0) from diphtheria, 63 (8) from diarrhœa and enteritis under two years, and 5 (0) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 216 (corresponding to a rate of 34 per thousand total births), including 12 in London.

Appointments

SCOTT, G. S., MB EDIN.: examining factory surgeon for Malvern, Worcs.

THOMAS, J. W. TUDOR, MD, D SC WALES, MS LOND., FRCS: ophthalmic specialist medical referee for the county-court districts of Abergavenny, Blaenavon, Monmouth, Cardiff, Barry, Chepstow, Newport, Pontypool, Tredegar, Abertillery and Bargoed (circuit No. 24) and Aberdare, Mountain Ash, Merthyr Tydfil, Pontypridd, Ystradyfodwg, Porth, Bridgend, Neath and Port Talbot (circuit No. 30).

TOMS, W. H., MB EDIN.: RSO at Princess Beatrice Hospital, London.

Births, Marriages and Deaths

BIRTHS

COLTART.—On Sept. 5, at Chichester, the wife of Dr. W. S. Coltart—a daughter.

FICKLING.—On Sept. 8, at St. Albans, the wife of Mr. Benjamin Fickling, FRCS, LDS—a daughter.

GILBERT.—On Sept. 2, at Walton-on-Thames, the wife of Captain R. G. B. Gilbert, RAMC—a son.

GOLDEN.—On Aug. 18, at Norwich, the wife of Captain M. B. H. Golden, RAMC—a daughter.

GUEST.—On Sept. 4, at Preston, Lancs, the wife of Squadron-Leader Kenneth E. Guest, RAFVR—a son.

LONGMORE.—On Aug. 25, in Liverpool, the wife of Surgeon Lieutenant John B. Longmore, RNVR—a son.

NANKIVELL.—On Sept. 3, at Bournemouth, the wife of Mr. J. W. Nankivell, FRCS—a daughter.

O'MEARA.—On Aug. 29, the wife of Surgeon Lieut.-Commander P. J. O'Meara, RN—a son.

RAYNES.—On Sept. 7, the wife of Surgeon Lieutenant R. F. Raynes, RNVR, of Keston, Kent—a daughter.

SPOONER.—On Sept. 5, at Blandford, Dorset, the wife of Squadron-Leader W. H. Casswell Spooner, MB—a daughter.

WRIGLEY.—On Sept. 1, at Winchester, the wife of Dr. C. H. Wrigley—a son.

MARRIAGES

HOWELL—RISING.—On Sept. 4, at Fort William, Denis Roderick Starling Howell, DSC, surgeon lieut.-commander RNVR, to Enid Elizabeth Rising, section-officer RCAF (WD).

WATT—VALENTINE.—On Sept. 5, in London, Douglas Watt, surgeon lieutenant RNVR, to Rosalind Chris Valentine.

DEATHS

GULLAN.—On Sept. 9, at Formby, Archibald Gordon Gullan, MD LOND., FRCS, MRCP, lieut.-colonel RAMC (T), aged 73.

LUKIS.—On Sept. 9, Dulcie Helen Lukis, MD, BS LOND., of New Malden.

THOMAS.—On Sept. 4, in London, George Trevor Harley Thomas, FRCSE, major RAMC retd.

THORNE.—On Sept. 5, at Milverton, Somerset, Leslie Cavendish Thorne Thorne, MD DURH., aged 75.

WALKER.—On Sept. 6, at Duncan, Vancouver Island, BC, Sir Ernest Walker, KCIE, CB, MB EDIN., FRCSE, major-general IMS retd., aged 63.

Colonel ROBERT HAY, IMS, has been appointed honorary physician to the King, in succession to Colonel H. E. Shortt, who retired in April.

Dr. JAMES FERGUSON, medical officer of health for Surrey, has been elected chairman of the council of the Royal Sanitary Institute.

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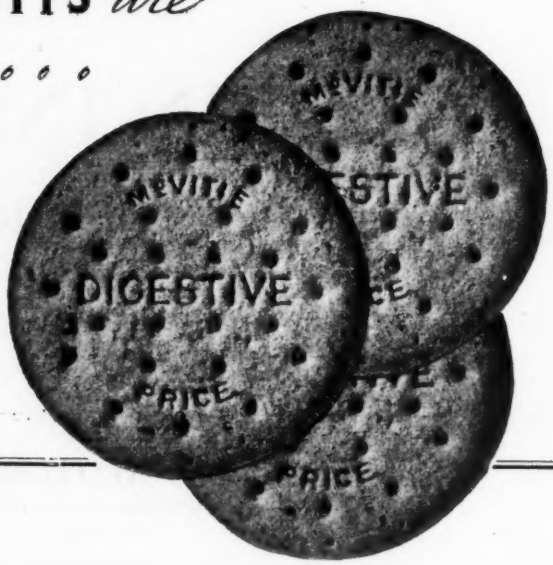

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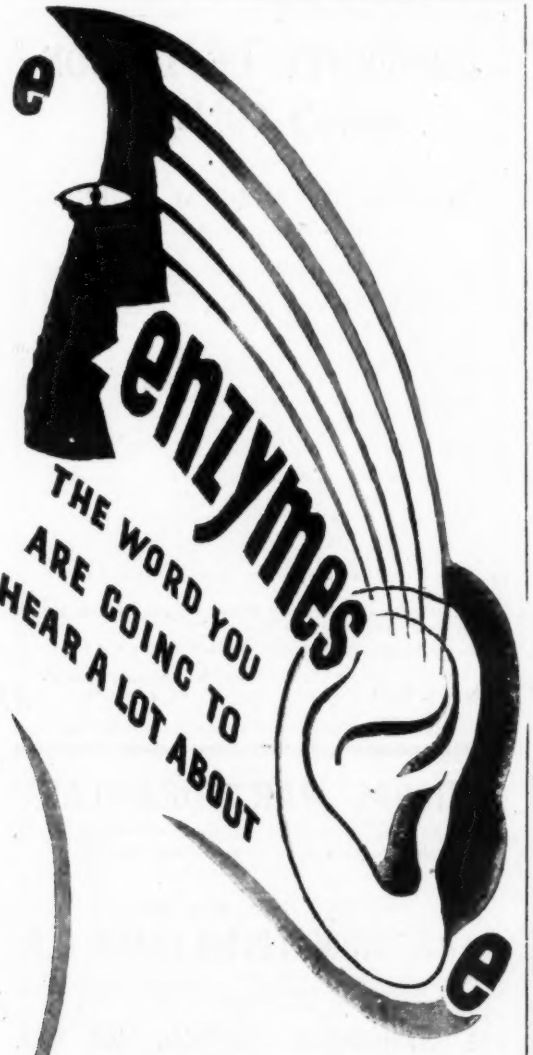

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Illustrated Brochure and particulars obtainable from A. E. CARVER, M.D., D.P.M., Resident Medical Superintendent.

VALE OF CLWYD SANATORIUM

This Sanatorium is established for the treatment of Tuberculosis of the Lungs and the Pleural Cavities. It is situated in the midst of a large area of park-land at a height of 450 feet above sea-level. Average rainfall 29·57 per annum. Full day and night Nursing Staffs. X-ray plant. Every facility for Artificial Pneumothorax and for operations on the Chest. Electric Lighting. Central Heating.

For particulars apply to Medical Superintendent.

H. MORRISTON DAVIES, M.D., M.Ch. (Cantab.), F.R.C.S., Llanbedr Hall, Ruthin, N. Wales.

COURT HALL, KENTON, near EXETER

FOR THE TREATMENT OF EIGHT LADIES, VOLUNTARY, TEMPORARY AND CERTIFIED PATIENTS

CLIFFDEN, TEIGNMOUTH

FOR EARLY AND CONVALESCENT CASES Recreational Therapies are held daily by skilled Leaders

The house stands high with spacious balconies and extensive views of the South Devon Coast. Beautiful garden. Own Dairy in 25 acres. Private road to beach

There is also a charming house, **EBWORTHY, MANATON, DARTMOOR**, situated in 20 acres, 1100 ft. up for bracing moorland air

Resident Physicians—BERTHA M. MULES, M.D., B.S. ANNE S. MULES, M.R.C.S., L.R.C.P. *Telephones*—STARCROSS 259 and TEIGNMOUTH 289

CAMBERWELL HOUSE, 33, Peckham Road, London, S.E.5

Telegrams: "PSYCHOLIA, LONDON" FOR THE TREATMENT OF MENTAL DISORDERS *Telephone:* RODNEY 4242 (2 lines)

Completely detached Villas for mild cases. Voluntary Patients received. Twenty acres of grounds; own garden produce. Hard and grass tennis courts, putting greens, Recreation Hall with Badminton Court, and all indoor amusements. Occupational therapy, Calisthenics, Actino-therapy, prolonged immersion baths, shock and also modified insulin treatment. Chapel.

Senior Physician, Dr. HUBERT JAMES NORMAN, assisted by a resident Medical Staff and visiting Consultants

An Illustrated Prospectus giving fees, which are strictly moderate, may be obtained upon application to the Secretary

The Convalescent Branch is HOVE VILLA, BRIGHTON and is 200 ft. above sea-level

PECKHAM HOUSE, 112, Peckham Road, London, S.E.15

Telegrams: "Alleviated, London" **Telephone: Rodney 2641-2642**

A Private Mental Hospital, for Ladies and Gentlemen suffering from Nervous and Mental Illness, where the amenities of a comfortable home are combined with full investigation and every well-established modern treatment.

Terms from 3½ guineas weekly.

Illustrated Prospectus may be obtained from the Physician Superintendent.

THE OLD MANOR, SALISBURY

Telephone: 3216 & 3217

A Private Hospital for the Care and Treatment of those of both sexes suffering from MENTAL DISORDERS

Extensive grounds. Detached Villas. Chapel. Garden Produce from own gardens. Terms very moderate.

CONVALESCENT HOME AT BOURNEMOUTH

standing in 12 acres of ornamental grounds, with separate villas, tennis courts, etc. Patients or Boarders may visit the Home by arrangement.

Illustrated Brochure on application to the Medical Superintendent, The Old Manor, Salisbury.

ST. ANDREW'S HOSPITAL FOR NERVOUS AND MENTAL DISORDERS

NORTHAMPTON

PRESIDENT: THE MOST HON. THE MARQUESS OF EXETER, K.G., C.M.G., A.D.C.

MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., F.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, bio-chemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods: insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombieres treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-Ray Room, an Ultra-violet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for bio-chemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a Park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: No. 2356 and 2357 Northampton), who can be seen in London by appointment.

TOR-NA-DEE SANATORIUM

Managing Director: DAVID LAWSON, M.D., F.R.S.E.

FOR THE TREATMENT OF PULMONARY TUBERCULOSIS AND ALLIED DISEASES

Senior Physician and Medical Superintendent: R. Y. KEERS, M.D. (Edin.), F.R.F.P.S. (Glas.).

For prospectus apply to The Secretary, Tor-na-Dee, Murtle, Aberdeenshire Telephone: Cults 107

CHEADLE ROYAL CHEADLE CHESHIRE

A Registered Hospital for MENTAL DISEASES, and its Seaside Branch, GLAN-Y-DON, Colwyn Bay, N. Wales

THE object of this Hospital is to provide the most efficient means for the treatment and care of those of the Upper and Middle Classes suffering from MENTAL and NERVOUS DISEASES. The Hospital is governed by a Committee appointed by the Trustees of the Manchester Royal Infirmary. VOLUNTARY, TEMPORARY, AND CERTIFIED PATIENTS RECEIVED

For Terms and further information apply to the MEDICAL SUPERINTENDENT Telephone: GATLEY 2231

CRICHTON ROYAL, DUMFRIES

FOR NERVOUS AND MENTAL DISORDERS

Cases of Alcoholism and Drug Addiction are admitted. Every facility for individual treatment on the most modern lines. As the Hospital is well endowed, terms are exceptionally moderate.

Medical Certificates given anywhere in the British Isles are valid for admission of patients.

Physician Superintendent: P. K. MCCOWAN, J.P., M.D., F.R.C.P., D.P.M., Barrister-at-Law. Tel.: Dumfries 1119.

THE COTSWOLD SANATORIUM

On the Cotswold Hills, seven miles from Cheltenham, Stroud and Gloucester. Fully equipped for the treatment of all forms of Tuberculosis.

Terms: 6 to 10 guineas per week, inclusive.

Full particulars from MEDICAL SUPERINTENDENT, COTSWOLD SANATORIUM, CRANHAM, GLOUCESTER.

Telephone: Witcombe 2181 Telegrams: "Hoffman, Birdlip"

UNIVERSITY EXAMINATION POSTAL INSTITUTION

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Over 50 years' experience

POSTAL COACHING FOR ALL MEDICAL EXAMINATIONS

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CHISWICK HOUSE,

PINNER, MIDDLESEX.

Telephone: PINNER 234.

A Private Hospital for the Treatment and Care of Mental and Nervous Illnesses in both Sexes.

A modern country house, 12 miles from Marble Arch, in attractive and secluded surroundings. Fees from 10 guineas per week inclusive. Cases under Certificate, Voluntary and Temporary Patients received for treatment.

DOUGLAS MACAULAY, M.D., D.P.M.

HEIGHAM HALL, NORWICH

PRIVATE MENTAL HOME for Nervous and Mental illness. All forms of treatment available. Fees from 4 gns. per week upwards according to requirements. Vacancies occasionally exist at reduced fees on the recommendation of the patient's own physician.

Apply to Dr. J. A. SMALL. Telephone: Norwich 20080

NORTHUMBERLAND HOUSE

Green Lanes, Finsbury Park, N.4

A PRIVATE HOSPITAL for the treatment of mental and nervous illnesses. Conveniently situated and easy of access from all parts. Six acres of ground, facing Finsbury Park. Voluntary and Temporary Patients received without certification. E.C.T. Shock therapy, Psychotherapy, and other modern forms of treatment. Air-raid Shelters have been provided. Telephone: STAmford Hill 2688. Telegrams: "Subsidiary, London."

For further particulars apply to the Medical Superintendent, ROBERT M. RIGGALL, Member British Psycho-Analytical Society.

L. M. S. S. A.

FINAL EXAMINATION: SURGERY, October 9th, November 13th, December 4th, 1944. MEDICINE, PATHOLOGY, October 16th, November 20th, December 11th, 1944. MIDWIFERY, October 17th, November 21st, December 12th, 1944. MASTERY of MIDWIFERY EXAMINATIONS, May and November.

For regulations apply REGISTRAR, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

A Refresher Course in Tuberculosis for Tuberculosis Officers and General Medical Practitioners, Saturday and Sunday, 7TH and 8TH OCTOBER, at the Latin Theatre, BIRMINGHAM UNIVERSITY, in collaboration with the Public Health Department, City of Birmingham.

Lecturers: H. H. Newsholme, M.D., F.R.C.P.; J. R. A. D. Todhunter, M.B., B.C.; J. M. Taylor, M.D.; D. J. Peebles, M.B.; J. F. Brailsford, M.D., F.R.C.P.; Prof. Leonard Parsons, M.D., F.R.C.P.; A. Brian Taylor, M.D., F.R.C.P.; R. Milnes Walker, M.S., F.R.C.S.; J. E. Geddes, M.D.; and J. B. Leather, F.R.C.S.

Fee, £1 11s. 6d., to: Dr. HARLEY WILLIAMS, N.A.P.T., Tavistock House North, London, W.C.1. Tea and lunch obtainable, 5s. extra, payable in advance.

EXAMINING SURGEONS: Factories Act, 1937. The following appointments as Examining Surgeon under the Factories Act, 1937, are vacant. Applications should be sent to the Chief Inspector of Factories, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of application*
HODDESDON ..	HERTFORD ..	25TH SEPTEMBER, 1944
KILSYTH ..	STIRLING ..	25TH SEPTEMBER, 1944

BRITISH POSTGRADUATE MEDICAL SCHOOL. (University OF LONDON.) Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE PHYSICIAN (A), vacant 1st November, 1944. The appointment is for 6 months. The salary is at the rate of £105 p.a., plus full residential emoluments. Practitioners liable to service under the National Service Acts and who have not yet completed 3 months since date of qualification may apply.

Apply the Dean, British Postgraduate Medical School, Ducane-road, W.12, before October 10th, 1944.

BRITISH POSTGRADUATE MEDICAL SCHOOL. (University of LONDON.) Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A) (Obstetrics), vacant 1st November, 1944. The appointment is for 6 months. The salary is at the rate of £105 p.a., plus full residential emoluments. Practitioners liable under the National Service Acts and have not yet completed 3 months since date of qualification may apply.

Apply the Dean, British Postgraduate Medical School, Ducane-road, W.12, before 1st October, 1944.

CONNAUGHT HOSPITAL, Walthamstow, E.17. Applications are invited from registered medical practitioners, Male and Female, for the appointment of CASUALTY OFFICER (A), vacant 1st October, 1944. Salary at the rate of £120 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when the appointment will be for a period of 6 months.

Applications to be sent as soon as possible to—

R. HALTON HARRISON, Secretary.

WOOLWICH MEMORIAL HOSPITAL, Shooters Hill, London, S.E.18. (General Hospital—137 Beds.) JUNIOR RESIDENT MEDICAL OFFICER (A). Applications for this post are invited from Male and Female registered medical practitioners. Duties will include those of House Physician and Casualty Officer. Salary £175 p.a., with full residential emoluments. The appointment will be for 6 months. Practitioners within 3 months of qualification and liable under the National Service Acts may apply.

Applications should be sent forthwith to the Secretary, Medical Committee, at the Hospital.

WEIR HOSPITAL, Weir-road, Balham, S.W.12. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE SURGEON (B2), vacant now. Salary is at the rate of £200 p.a., with full residential emoluments. R and W practitioners who now hold A posts may apply, when appointment will be limited to 6 months.

Applications should be sent to the Honorary Secretary-Superintendent.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. (E.M.S.— Sector II.) Applications are invited from registered medical practitioners, Male and Female, for the appointment of RESIDENT HOUSE OFFICER (A) (combined duties of House Physician, House Surgeon, and Casualty Officer), vacant 1st October, 1944. Salary is at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months; otherwise for a period of at least 6 months.

Applications to the Secretary.

TILBURY HOSPITAL, Tilbury, Essex. Applications are invited from registered Male practitioners for the appointment of RESIDENT HOUSE SURGEON AND CASUALTY OFFICER (B1), vacant shortly. Applicants should have held appointments and had surgical experience. Salary is at the rate of £350 p.a., with full residential emoluments. Suitably qualified R practitioners holding B2 appointments, also those holding B1 and rejected by the R.A.M.C., may apply.

Applications, stating age, qualifications with dates, experience, and details of previous appointments, with copies of 3 recent testimonials, should be sent to the undersigned immediately.

F. A. LYON, Administrator and Secretary.

Seamen's Hospital Society, Greenwich, S.E.10.

KING EDWARD MEMORIAL HOSPITAL, Ealing. Applications are invited from registered medical practitioners, including practitioners within 3 months of qualification and liable under the National Service Acts, for the appointment of HOUSE SURGEON (A) to Special Departments (Gynæcological, E.N.T., &c., including Anæsthetics), vacant now. 6 months' appointment. Salary at the rate of £150 p.a., with full residential emoluments.

Applications, stating age, nationality, qualifications with dates, and details of experience, together with copies of 2 recent testimonials, should be sent immediately to—

R. A. MICKELWRIGHT, House Governor.

ROYAL FREE HOSPITAL, Gray's Inn-road, London, W.C.1. Applications are invited from registered medical Women practitioners for the appointment of RESIDENT ASSISTANT PATHOLOGIST at the above Hospital, now vacant. Salary at the rate of £250 p.a. (resident).

Applications, stating age, qualifications, and experience (which is essential), accompanied by copies of 3 recent testimonials, should be sent on or before the 23rd instant to—

RICHARD T. BARTLEY, Secretary.

ROYAL WATERLOO HOSPITAL FOR CHILDREN AND WOMEN, Waterloo-road, S.E.1. Applications are invited from registered medical practitioners (Male and Female) for the appointment of RESIDENT HOUSE PHYSICIAN (B2), vacant 1st October, 1944. The salary is at the rate of £200 p.a., with full residential emoluments. R and W practitioners who now hold A posts may apply, when the appointment will be limited to 6 months.

Applications, stating age and qualifications with dates, should be sent to the undersigned and accompanied by copies of 3 recent testimonials. J. H. TEASDALE, Secretary.

ROYAL LONDON OPHTHALMIC HOSPITAL. (Moorfields EYE HOSPITAL), City-road, E.C.1. Applications are invited for the posts of 3 REFRACTION ASSISTANTS, 1 to attend on Mondays and Thursdays and 2 to attend on Wednesdays and Saturdays (mornings) each week. Candidates must be registered medical practitioners. Salary at the rate of £1 10s. per attendance. The Medical Officers will be appointed for the period to the 31st December and will be eligible for reappointment.

Applications, with testimonials, stating age and qualifications, must be received by the undersigned not later than the 9th October, 1944.

LONDON CHEST HOSPITAL, Victoria Park, E.2. Applications are invited for the appointment of HOUSE PHYSICIAN (B2) (Male or Female), required on 1st November. 6 months' appointment. Salary at the rate of £150 p.a. Board, residence, and laundry provided. R and W practitioners holding A posts may apply.

Applications, with copies of 3 recent testimonials, should be sent at once to the Secretary.

METROPOLITAN BOROUGH OF ISLINGTON. Temporary MEDICAL OFFICER (Part-time). Applications are invited from registered medical practitioners to attend weekly, on a sessional basis, at the Council's Cleansing Station in connexion with the diagnosis and treatment of Scabies and associated skin conditions, and other work which may arise under the Scabies Order, 1941. Remuneration at the rate of 1½ guineas (plus 20%) per 2-hour session.

Applications, together with copies of testimonials or references, should be forwarded not later than Monday, 25th September, to the Medical Officer of Health, at the Town Hall, Upper-street, London, N.1. W. ERIC ADAMS, Town Clerk.

MIDDLESEX COUNTY COUNCIL. Resident Casualty Officer (B2) required at Hillingdon County Hospital, near Uxbridge, Middlesex. Applications invited from registered medical practitioners who have held house appointments and had good all-round experience (including R practitioners who now hold A posts). Salary £350 p.a., plus cost-of-living bonus. Board, lodging, and laundry. Whole-time duties, under Medical Director, will include dealing with casualties and admissions to Hospital, and such other duties as may be required. Appointment is primarily for 6 months, with possibility of extension to 12 months (except in case of R practitioners). Post vacant early October.

Applications, stating age, nationality, qualifications, present post, and previous experience, and enclosing copies of not more than 3 recent testimonials, to be made to the Medical Director of Hospital, "B3." Application forms not provided. Closing date 30th September, 1944.

C. W. RADCLIFFE, Clerk of the County Council.

Middlesex Guildhall, Westminster, S.W.1.

Post not open to W practitioners, as there is no accommodation at Hospital for women doctors.

MIDDLESEX COUNTY COUNCIL. Resident Junior Assistant MEDICAL OFFICER (Anæsthetist, B2) required at West Middlesex County Hospital, Isleworth, Middlesex. Applications invited from registered medical practitioners, including R and W practitioners who now hold A posts. Salary £250 p.a., plus cost-of-living bonus. Board, lodging, and laundry. Whole-time duties, such as Council may direct, under supervision of Medical Director. Appointment, subject to medical examination and 1 month's notice, is for 6 months, with possibility of extension to 12 months (except in case of R and W practitioners). Post now vacant.

Applications, stating age, nationality, qualifications, present post, and previous experience, enclosing copies of not more than 3 recent testimonials, to Medical Director, "B3," of Hospital. Application forms not provided. Closing date 23rd September, 1944. C. W. RADCLIFFE, Clerk of the County Council.

Middlesex Guildhall, Westminster, S.W.1.

KING GEORGE HOSPITAL, Ilford. Applications are invited from registered medical practitioners, Male and Female, for the appointment of RESIDENT ANÆSTHETIST (B1), now vacant. The salary is at the rate of £350 p.a., with full residential emoluments. Suitably qualified R and W practitioners holding B2 appointments, also R practitioners holding B1 and rejected by the R.A.M.C., may apply.

Applications, stating age, qualifications with dates, nationality, and present post, accompanied by 3 testimonials, should be sent as soon as possible to—

G. AUSTIN HEPWORTH, Secretary and Superintendent.

UPTON EMERGENCY HOSPITAL, Chester. Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (B2). The salary is at the rate of £200 p.a., with full residential emoluments. R and W practitioners who now hold A posts may apply, when the appointment will be limited to 6 months.

Applications should be addressed to the Medical Superintendent, Upton Emergency Hospital, Chester.

9th September, 1944.

HIS MAJESTY'S COLONIAL SERVICE

THE COLONIAL MEDICAL SERVICE

VACANCIES FOR MEDICAL OFFICERS

The maintenance of an efficient Colonial Medical Service constitutes a vital part of the national war effort and it is most important that the Service should be assured of an adequate supply of doctors.

The Secretary of State for the Colonies therefore invites applications from doctors possessing a medical qualification registrable in the United Kingdom who are British subjects and who are under thirty-five years of age.

Medical Officers are appointed in the first instance for general service. But there are ample opportunities for work in special branches of medicine and surgery, in public health and in medical research.

The normal salary scale is from £600 to between £1,000 and £1,120. There are large numbers of super-scale posts to which promotion is made on merit and which carry higher salaries.

Government quarters, in many cases free of rent, and first-class passages to and from the Colonies are provided, and an adequate pension scheme is in force.

Selected candidates are normally required to attend a course of instruction in Tropical Medicine and Hygiene either before proceeding overseas or during their first period of leave.

Further particulars, including the regulations governing admission to the Colonial Medical Service, may be obtained from the Director of Recruitment (Colonial Service), 2, Park-street, London, W.1.

COUNTY COUNCIL OF THE WEST RIDING OF YORKSHIRE. SCALEBOR PARK MENTAL HOSPITAL, near LEEDS. Applications are invited from registered medical practitioners, Male and Female, for the appointment of TEMPORARY RESIDENT ASSISTANT MEDICAL OFFICER (B1), vacant shortly. Salary £400 to £450 p.a., according to experience, plus board, residence, &c., valued at £120 p.a. An additional £50 p.a. is payable if person appointed holds or obtains the Diploma in Psychological Medicine. Suitably qualified R and W practitioners holding B2 appointments, also those holding B1 and rejected by the R.A.M.C., may apply. Married quarters are not available.

Forms of application may be obtained from the undersigned, by whom they must be received as early as possible.

BERNARD KENYON, Clerk to the Visiting Committee.

County Hall, Wakefield, September, 1944.

NOTTINGHAM GENERAL HOSPITAL. (712 Beds, including E.M.S. Beds.) Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A), duties to commence on or about 11th November. Salary at the rate of £200 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications to be addressed to the undersigned, stating age, qualifications, experience, &c., together with copies of testimonials.

HENRY M. STANLEY,
House Governor and Secretary.

CORNWALL COUNTY COUNCIL. Applications are invited from registered medical practitioners, who are not liable to recruitment or civil direction, for appointment as TEMPORARY ASSISTANT SCHOOL MEDICAL OFFICER. Salary will be at the rate of £500 p.a., rising by annual increments of £25 to a maximum of £700 a year. In fixing the initial salary of the selected candidate consideration may be given to previous experience. A car is essential, and travelling expenses will be paid on the County Scale.

Applications, stating age, qualifications, and experience, with copies of 3 testimonials, should be sent to the County Medical Officer, County Hall, Truro, by the 4th October, 1944.

The Minister of Health has approved this appointment.

L. P. NEW, Clerk of the County Council.

County Hall, Truro, 11th September, 1944.

PEAMOUNT SANATORIUM, Newcastle, Co. Dublin. Applications are invited from registered medical practitioners, Male, for the post of ASSISTANT RESIDENT MEDICAL SUPERINTENDENT to the above Sanatorium. Salary at the rate of £300 p.a., with furnished apartments, board, laundry, and attendance. Age limit 35 years. Applicants are required to have held appointment in a teaching hospital and to have had experience in the treatment of pulmonary tuberculosis. The appointment is for 1 year subject to renewal.

Applications, together with particulars of training and experience and copies of recent testimonials, should reach the Secretary, Peamount Sanatorium, 9, Ely-place, Dublin, on or before 9th October, 1944.

NORTHAMPTON GENERAL HOSPITAL. (408 Beds.) Applications are invited immediately from registered medical practitioners, Male and Female, for the appointments of HOUSE PHYSICIAN (A) and RESIDENT ANÆSTHETIST (B2). Salary for the A post at rate of £150 p.a., and for the B2 post at rate of £200 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply for the A post, when appointment will be for a period of 6 months. R and W practitioners holding A posts may apply for the B2 post, when appointment will be limited to 6 months.

Applications should be sent as soon as possible to—

GORDON S. STURTRIDGE.

PRESTON AND COUNTY OF LANCASTER ROYAL INFIRMARY. Applications are invited from registered medical practitioners, including R and W practitioners who now hold A posts, for the appointment of RESIDENT ANÆSTHETIST (B2), vacant 30th September. In the case of R and W practitioners the appointment will be for 6 months. Salary £200–£300 p.a., according to experience, but £350 will be paid to a successful candidate holding the D.A. Full residential allowances.

Applications, stating full particulars, should be addressed to the Superintendent, Royal Infirmary, Preston.

THE ST. HELENS HOSPITAL. Applications are invited for House SURGEON (B2) and HOUSE SURGEON (A). Both vacancies from 1st October. Salary for the B2 post £225 p.a. and for the A post £150. Both appointments carry full residential emoluments. For the B2 post, R and W practitioners holding A posts may apply, when appointment is limited to 6 months. For the A post, practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications, together with 3 recent testimonials, to be submitted to: GEORGE HARPER, Secretary.

THE STAFFORDSHIRE GENERAL INFIRMARY, Stafford. Applications are invited from registered medical practitioners, Male and Female, for the following appointments:—

HOUSE SURGEON (A), vacant in October.

HOUSE PHYSICIAN (A), to commence duties on the 1st October. Salary in each case £196 p.a., with board-residence. Practitioners within 3 months of qualification and liable under the National Service Acts may also apply, when appointment will be for 6 months.

Applications, with full particulars as to age and qualifications, accompanied by 3 recent testimonials, to be forwarded to the Secretary.

Stafford, 7th September, 1944.

COUNTY BOROUGH OF BOLTON. Townleys Hospital, FARNWORTH. Applications are invited from registered Male medical practitioners for the appointment of TEMPORARY ASSISTANT RESIDENT MEDICAL OFFICER (B1). An interest in obstetrics is desirable. The salary will be at the rate of £350 p.a., plus bonus, with emoluments valued at £130 p.a. Suitably qualified R practitioners holding B2 appointments, also those now holding B1 and rejected by the R.A.M.C., may apply.

Application forms, which may be obtained from the Medical Officer of Health, Public Health Department, Civic Centre, Bolton, to be completed and returned, together with copies of 2 recent testimonials, as soon as possible to—

PHILIP S. RENNISON, Town Clerk.

Town Hall, Bolton, 1st September, 1944.

ROYAL SUSSEX COUNTY HOSPITAL, Brighton. (376 Beds.) Applications are invited from registered medical practitioners (Male or Female) for the post of CASUALTY HOUSE SURGEON (A). The salary attached to the post is £175 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications should be sent before 23rd September, 1944, to—

L. L. W. LANCASTER-GAYE, Secretary-Superintendent.

MANSFIELD AND DISTRICT GENERAL HOSPITAL, Notts. (189 Beds and 89 E.M.S. Beds.) Applications are invited from registered medical practitioners for the appointments of HOUSE SURGEON (A) and HOUSE PHYSICIAN (A), both posts now vacant. Salary for each is at the rate of £220 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when the appointments will be for a period of 6 months.

Applications should be sent immediately to—

K. L. WARD, Secretary.

BURY INFIRMARY, Lancs. (159 Beds.) Applications are invited from registered medical practitioners (Male and Female) for the appointment of CASUALTY AND SPECIALS HOUSE SURGEON (A), now vacant. Salary is at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for 6 months; otherwise renewable.

Applications, giving full particulars, immediately to—

H. WILKINSON, Superintendent.

NOBLE'S ISLE OF MAN HOSPITAL, Douglas, Isle of Man. (137 Beds.) Applications are invited from Male or Female registered medical practitioners for the appointment of SECOND HOUSE SURGEON (A). Salary is at the rate of £175 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months; otherwise for a period of 12 months.

Applications, with copies of 2 recent testimonials, should reach the undersigned as soon as possible.

Douglas, 26th August, 1944. E. K. KELLY, Secretary.

SWANSEA GENERAL AND EYE HOSPITAL. Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A), now vacant. Salary is at the rate of £165 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications should be forwarded to—

O. C. HOWELLS, Secretary-Superintendent.

WINTERTON EMERGENCY HOSPITAL. (1060 Beds.) Applications are invited from registered medical practitioners, Male and Female, including practitioners within 3 months of qualification and liable under the National Service Acts, for the following appointments, now vacant:—

HOUSE PHYSICIAN (A).
HOUSE SURGEONS (A).
HOUSE SURGEONS (A) to Fracture A Centre and Rehabilitation Unit.

Salaries at the rate of £120 p.a., with full residential emoluments. The appointments will be for a period of 6 months.

Applications should be forwarded to the Surgeon-in-Charge, Winterton Emergency Hospital, Sedgefield, Co. Durham.

PRINCESS ELIZABETH ORTHOPÆDIC HOSPITAL, Buckerell BORE, EXETER. (E.M.S. Fracture and Orthopædic Centre 1A. 150 Beds with Annexe.) Applications are invited from registered medical practitioners for the post of HOUSE SURGEON (B1), vacant 1st November. Salary £200 p.a., with board, residence, and laundry. The appointment is for 6 months. Suitably qualified R and W practitioners holding B2 posts, also R practitioners holding B1 and rejected by the R.A.M.C., may apply.

Applications to: P. MELHUISH, Secretary.

COUNTY BOROUGH OF WALLASEY. Applications are invited for the post of ASSISTANT MEDICAL OFFICER OF HEALTH AND ASSISTANT SCHOOL MEDICAL OFFICER (Male or Female), at a salary of £700 p.a. The appointment will be in the first place a temporary one, but will be reviewed at the end of the war. Applicants should hold the Diploma in Public Health. The work will be that of school medical inspection, attendance at clinics and child welfare centres, and any general public health work that may be required; also work in connexion with Civil Defence.

Applications, stating age, qualifications with dates, and the date when duties could be commenced, accompanied by copies of 3 recent testimonials, should reach the Medical Officer of Health, Town Hall, Wallasey, not later than 30th September.

EMRYS EVANS, Town Clerk.

THE ROYAL HOSPITAL, Wolverhampton. (Incorporated under Royal Charter.) (310 Beds.) Applications are invited from registered medical practitioners for the appointment of RESIDENT REGISTRAR (B1) to the Ear, Nose, and Throat Department, vacant 1st November. Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding diploma of F.R.C.S. and D.L.O. Salary up to £400 p.a., according to experience, with full residential emoluments. Suitably qualified R and W practitioners holding B2 appointments, also R practitioners now holding B1 and rejected by the R.A.M.C., may apply.

W. COCKBURN, House Governor.

11th September, 1944.

DUCHESS OF YORK HOSPITAL FOR BABIES, Manchester, 19. Applications are invited from registered medical practitioners (Male and Female) for the post of SENIOR RESIDENT MEDICAL OFFICER (B1), vacant 8th November, 1944. The appointment is for 6 months. Salary is at the rate of £175 p.a., with full residential emoluments. R and W practitioners now holding B2 posts, also R practitioners holding B1 and rejected by the R.A.M.C., may apply.

Applications, accompanied by copies of 3 recent testimonials, to be sent by the 23rd September, 1944, to—

LOUISE GILLESPIE, Secretary.

DURHAM COUNTY COUNCIL. Dryburn Hospital, Durham. Applications are invited from registered medical practitioners (Male or Female) for the appointment of RESIDENT ASSISTANT MEDICAL OFFICER (B2). Salary £200 p.a., with full residential emoluments. R and W practitioners who now hold A posts may apply, when the appointment will be for 6 months; otherwise it will be renewable for a further 6 months. The main duty will be to take charge of ward of 30 Beds devoted to the care of fractured spines (mainly ex-Service). The successful candidate will work under the direction of the consulting neurological surgeon, and in addition will be expected to perform such other duties as may be assigned by the Medical Superintendent. The appointment will be subject to the regulations for the time being of the County Council, relative to the payment of salary in case of sickness, and the successful applicant will be required to pass the County Council's medical examination. The appointment is terminable by 1 calendar month's notice on either side.

Applications, stating age, liability for military service, medical fitness, position as regards deferment, &c., should be sent at once to the Medical Superintendent.

IAN MCCRACKEN, County Medical Officer of Health.

Shire Hall, Durham, 8th September, 1944.

COUNTY OF HERTFORD. Hemel Hempstead E.M.S. Base HOSPITAL. Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE OFFICER (B2), vacant 1st September, 1944. Salary at the rate of £200 p.a. R and W practitioners holding A posts may also apply, when appointment will be limited to 6 months; otherwise not exceeding 1 year.

Applications should be sent as soon as possible to the Medical Superintendent, Hemel Hempstead E.M.S. Base Hospital. Testimonials should not be sent, but applications should give full particulars of the candidate, together with the names of 2 persons to whom reference can be made.

HUDDERSFIELD ROYAL INFIRMARY. (321 Beds.) Resident ANÆSTHETIST AND ASSISTANT CASUALTY OFFICER (A), required to commence shortly. Salary at the rate of £150, with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications should be sent as soon as possible to—

H. J. JOHNSON, General Superintendent and Secretary.

HUDDERSFIELD ROYAL INFIRMARY. (321 Beds.) House SURGEON (A), required to commence 19th October, 1944. Salary at the rate of £150, with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications, together with testimonials, should be sent as soon as possible to—

H. J. JOHNSON, General Superintendent and Secretary.

CARDIFF ROYAL INFIRMARY. (Associated with the Welsh NATIONAL SCHOOL OF MEDICINE.) Applications are invited for the vacancy shortly to arise in the office of HONORARY PHYSICIAN. The regulations provide that "Each Honorary Physician and Honorary Assistant Physician shall be a Graduate in Medicine of a University of the United Kingdom, and he shall not practise Surgery or Midwifery. He shall also be, or within a year of his appointment shall become, a Fellow or Member of the Royal College of Physicians of London, or a Fellow of one of the other Royal Colleges of Physicians in the United Kingdom." The present Senior Assistant Physician is a candidate for the vacancy.

Each candidate is required to send 12 copies of his application and testimonials (for circulation amongst members of the Election Committee and Medical Board), stating age, qualifications, appointments held, &c., and endorsed "Honorary Physician," to reach the undersigned on or before 2nd October, 1944. The 12 copies of the application and testimonials may be cyclostyled in order to save expense and paper.

P. ARMSTRONG, Medical Superintendent.

7th September, 1944.

CITY OF MANCHESTER. Withington Hospital. (1150 Beds.) Applications are invited from registered medical practitioners, Male or Female, for the appointment of TEMPORARY RESIDENT ASSISTANT MEDICAL OFFICER (B1) to the Tuberculosis Wards, vacant now. Candidates should have had experience in the treatment of pulmonary tuberculosis. The appointment will be temporary for the duration of the war. Salary £350 p.a., rising by annual increments of £25 to £450, with board, residence, and laundry valued at £85 in addition, subject to the Manchester Corporation conditions of service. A temporary cost-of-living wages addition is payable in addition to the salary stated. Suitably qualified R and W practitioners holding B2 appointments, also those now holding B1 and rejected by the R.A.M.C., may apply.

Full information and forms of application may be obtained from the Medical Officer of Health, Hospitals Administration Section, G.P.O. Box 399, Town Hall, Manchester, 2, and applications for the post must be received by him not later than 3rd October, 1944. Canvassing in any form is prohibited.

R. H. ADCOCK, Town Clerk.

Town Hall, Manchester, 2, 7th September, 1944.

CITY OF PLYMOUTH. City General Hospital. Applications are invited from duly qualified and registered medical practitioners, Male and Female, including practitioners within 3 months of qualification and liable under the National Service Acts, for the appointment of JUNIOR ASSISTANT MEDICAL OFFICER (A) at the City General Hospital. The appointment will be for a period of 6 months, but terminable by 1 month's notice on either side at any time. Salary is at the rate of £250 p.a., plus war bonus, and full residential emoluments. All fees received by the officer must be refunded to the Council. The duties will be mainly in the surgical side of the Hospital. Further details may be obtained from the Medical Superintendent of the Hospital.

Forms of application are not provided. Applications must be addressed to the undersigned, together with copies of not more than 3 recent testimonials, as soon as possible.

T. PEIRSON, Medical Officer of Health.

Seven Trees, Lipson-road, Plymouth.

YORK COUNTY HOSPITAL. (222 Beds.) Applications are invited from registered medical practitioners, Male or Female, for the appointment as HOUSE SURGEON (A), vacant 24th October, 1944, whose main duties are in the Eye, Ear, Nose, and Throat Department (37 Beds, with busy Out-patient Clinics), but who will share in the general work of the Hospital, also Casualty duty. Salary is at the rate of £175 p.a., with full residential emoluments. This post is recognised for D.O.M.S. examination. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications to be sent immediately to—

J. R. MACKRILL, Secretary.

YORK COUNTY HOSPITAL. (222 Beds.) Applications are invited from registered medical practitioners, Male and Female, for the appointment of an ORTHOPÆDIC HOUSE SURGEON AND CASUALTY OFFICER (B2), vacant 21st October, 1944. The salary is at the rate of £175 p.a., with full residential emoluments. R and W practitioners who now hold A posts may apply, when the appointment will be limited to 6 months.

Applications to be sent immediately to—

J. R. MACKRILL, Secretary.

LINCOLN COUNTY HOSPITAL. (Voluntary Hospital—200 Beds.) Applications are invited from registered medical practitioners, Male or Female, for the appointment of HOUSE PHYSICIAN (A), vacant 1st November, 1944. Salary is at the rate of £225 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may also apply, when the appointment will be for 6 months.

ARTHUR MOORE, Secretary-Superintendent.

8th September, 1944.

CITY OF MANCHESTER. Crumpsall Hospital. (1400 Beds.) (Recognised under the regulations for the F.R.C.S.) Applications are invited from registered medical Men for the appointment of RESIDENT ASSISTANT MEDICAL OFFICER (A), vacant 30th September, 1944. The duties of the post are mainly medical. The basic salary for the appointment is £200 p.a., with board, residence, and laundry in addition, subject to the Manchester Corporation conditions of service. A temporary cost-of-living wages addition is payable in addition to the salary stated. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months; otherwise for 12 months.

Applications, stating the full name, age (giving date of birth), nationality, professional qualifications (with dates), particulars of present and past hospital appointments, are to be addressed to the Medical Superintendent, Crumpsall Hospital, Crumpsall, Manchester, 8, at once. Canvassing in any form is prohibited.

R. H. ADCOCK, Town Clerk.

Town Hall, Manchester, 2, 5th September, 1944.

CITY OF BIRMINGHAM. Dudley Road Hospital. (1000 Beds.) Applications are invited from registered medical practitioners, Male and Female, for the following appointments:—

JUNIOR MEDICAL OFFICER (A). The salary will be at the rate of £200 p.a., plus residential emoluments.

JUNIOR MEDICAL OFFICER (A) in the Maternity Block. The salary will be between £200 and £300 p.a., according to experience, plus emoluments. The Maternity Block has some 125 antenatal and obstetric beds and there are some 50 gynæcological beds in the Hospital.

Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointments will be for a period of 6 months; otherwise for 1 year.

Applications, stating age, qualifications, experience, and nationality, and accompanied by copies of 3 recent testimonials, should be addressed to the Medical Officer of Health, Public Health Department, Birmingham, 3, to reach him not later than the 27th September, 1944.

DERBYSHIRE ROYAL INFIRMARY, Derby. (Voluntary Hospital —Total Beds 416, plus 230 E.M.S.) Applications are invited from registered medical practitioners (Male and Female) for the appointment of CASUALTY OFFICER (A), vacant 1st October. Salary is at the rate of £200 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may also apply, when appointment will be for a period of 6 months.

Applications should be sent to—

ARTHUR TAYLOR, Superintendent and Secretary.

SUSSEX EYE HOSPITAL, Eastern-road, Brighton, 7. (48 Beds.) Applications are invited from registered medical practitioners (Male or Female) for the appointment of HOUSE SURGEON (B2), duties to commence as soon as possible. Salary is at the rate of £175 p.a., with full residential emoluments. R and W practitioners holding A posts may also apply, when appointment will be limited to 6 months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of 3 recent testimonials, should be sent to: PERCY F. SPOONER, Secretary-Superintendent.

ROYAL VICTORIA INFIRMARY, Newcastle upon Tyne. Applications are invited from registered medical practitioners for the open appointment of SURGICAL REGISTRAR (B1) to the Royal Victoria Infirmary from 1st October, 1944. Applicants should have held house appointments. The post is suitable for applicants wishing to study for the Fellowship examination. Salary is at the rate of £300 p.a. (non-resident). Suitably qualified R and W practitioners holding B2 posts, also R practitioners now holding B1 and rejected by the R.A.M.C., may apply.

Applications should be sent as soon as possible to—

4th September, 1944. A. W. SANDERSON, House Governor.

YORK MATERNITY HOSPITAL. Applications are invited from registered Female practitioners, including W practitioners who now hold A posts, for the appointment of OBSTETRIC HOUSE SURGEON (B2), vacant 1st November. There is a Senior Medical Officer in charge. Duties will consist of work at the Maternity Hospital, attendance at clinics, and such other duties as may be prescribed by the Medical Officer of Health. The appointment will be for 6 months and is subject to the Council's Sick Allowance Regulations. Salary at the rate of £200 p.a., with full residential emoluments. A war bonus of 7s. 9d. per week is also paid.

Applications, with testimonials, should reach the undersigned not later than 30th September. C. B. CRANE, M.B., D.P.H.,

Acting Medical Officer of Health.

Health Department, 50, Bootham, York.

LANCASHIRE COUNTY COUNCIL. Public Health Committee. ABBOTSFIELD HOSPITAL, FLIXTON, MANCHESTER. Applications are invited from registered medical practitioners (Male or Female), including R and W practitioners who now hold A posts, for the appointment of ASSISTANT MEDICAL OFFICER (B2). Salary is at the rate of £300 p.a., together with an allowance of £150 p.a. in lieu of residential emoluments. To R or W practitioners the appointment will be limited to 6 months; otherwise may be renewed for a further period of 6 months.

Forms of application may be obtained from the County Medical Officer of Health, Hospital and Medical Department, County Offices, Preston, to whom all applications must be forwarded not later than Monday, the 25th September, 1944.

GEORGE ETHERTON, Clerk of the County Council.

County Offices, Preston, 6th September, 1944.

CHESTERFIELD AND NORTH DERBYSHIRE ROYAL HOSPITAL, CHESTERFIELD. Applications are invited from registered medical practitioners for the appointment of HOUSE PHYSICIAN (A), vacant 1st October, 1944. Appointment will be for 6 months. Salary £165 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply.

Applications to—

M. H. BOONE, House Governor and Secretary.

BOROUGH OF MANSFIELD. Applications are invited from registered Male or Female medical practitioners for the temporary post of DEPUTY MEDICAL OFFICER OF HEALTH AND DEPUTY SCHOOL MEDICAL OFFICER. Applicants must possess the Diploma in Public Health or an equivalent qualification in State Medicine, and should have experience in school medical work, maternity and child welfare, and infectious diseases. Experience in intelligence testing and in bacteriological work is also desirable. The vacancy is occasioned by the resignation of the present Deputy Medical Officer, who has obtained another post, but the appointment will be temporary in accordance with the desires of the Ministry of Health. The appointment will be subject to the approval of the Ministry of Health and the provisions of the Local Government Superannuation Act, 1937. The successful candidate will be required to act under the direction of the Medical Officer of Health, to undertake the ordinary duties of Deputy Medical Officer of Health and Deputy School Medical Officer, to act as Deputy Superintendent of the Corporation's Infectious Diseases Hospital, and to perform any duties that the Council or any Committee thereof may from time to time deem necessary. The person appointed will be required to pass a medical examination, to devote the whole of his or her time to the duties of the appointment, and to reside within the Borough. Persons of military age must obtain permission of the Ministry of Health to apply for this position, under the terms of Circular 2818, dated 26th May, 1943; they must also submit with their application full information as to their liability for military service, medical fitness, and position as regards deferment. The salary will be at the rate of £700 p.a., plus war bonus (present amount £49 8s. p.a. male, £40 6s. p.a. female), and car allowance according to the Council's scale. Canvassing, either directly or indirectly, will be regarded as a disqualification.

Applications (on prescribed forms to be obtained at my office), accompanied by copies of 3 recent testimonials and endorsed "Deputy Medical Officer of Health," must be returned to me not later than Monday, the 2nd October, 1944.

A. C. SHEPHERD, Town Clerk.

Town Clerk's Office, Carr Bank, Mansfield,
4th September, 1944.

COUNTY BOROUGH OF SOUTHEND-ON-SEA. Education. COMMITTEE. CHILD GUIDANCE CLINIC. Applications are invited for appointment as Temporary Part-time PSYCHIATRIST to act as Director of the Child Guidance Clinic. Salary £275 p.a., together with payment of travelling expenses up to a maximum of 25s. per week.

Applicants should submit full details of experience, &c., together with copies of not more than 3 recent testimonials, to the Medical Officer of Health, Municipal Health Centre, Warrior-square, Southend-on-Sea, from whom full particulars may be obtained. Last day for receiving applications 2nd October. H. BOYES WATSON, Chief Education Officer.

Education Office, Warrior-square, Southend-on-Sea,
4th September, 1944.

LEICESTER ROYAL INFIRMARY. (950 Beds.) Applications are invited forthwith from registered medical practitioners for vacancy of CASUALTY OFFICER (B1), falling vacant 1st October. Applicants should have held house appointments and had surgical experience. Salary at the rate of £200 p.a. Suitable candidate will be asked to deputise for R.S.O. Suitably qualified R and W practitioners holding B2 appointments, also R practitioners now holding B1 and rejected by the R.A.M.C., may apply.

H. T. PLOWMAN, House Governor and Secretary.

5th September, 1944.

CITY OF MANCHESTER. Booth Hall General Hospital for CHILDREN. (760 Beds.) Applications are invited from registered medical practitioners, Male and Female, for the appointment of RESIDENT SURGICAL OFFICER (B1), vacant now, at the above-mentioned Class I E.M.S. Hospital. The appointment will be temporary for the duration of the war. Candidates must have practical surgical experience and, preferably, hold a high surgical qualification. Basic salary, in accordance with the Manchester Corporation conditions of service, commences at £475 p.a. and rises by annual increments of £25 to a maximum of £550, with full residential emoluments in addition. The salary is subject to a temporary cost-of-living wages addition. The commencing cash remuneration, at present, is £499 14s. Suitably qualified R and W practitioners holding B2 appointments, also those now holding B1 and rejected by the R.A.M.C., may apply.

Forms of application can be obtained from the Medical Officer of Health, Hospitals Administration Section, G.P.O. Box 399, Town Hall, Manchester, 2, and all applications must be received by him not later than 7th October, 1944. (Full details of the post can be obtained from the Medical Superintendent of Booth Hall Hospital, Blackley, Manchester, 9.) Canvassing in any form is prohibited. R. H. ADCOCK, Town Clerk.

Town Hall, Manchester, 2, 7th September, 1944.

ROYAL DEVON AND EXETER HOSPITAL, Exeter. Applications are invited from registered medical practitioners, Male and Female, for the following appointments:—

RESIDENT SURGICAL OFFICER (B1), now vacant. Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding diploma of F.R.C.S. Salary is at the rate of £250 p.a. Suitably qualified R and W practitioners holding B2 appointments, also R practitioners now holding B1 and rejected by the R.A.M.C., may apply.

HOUSE SURGEON (A) and HOUSE PHYSICIAN (A), now vacant. Salary in each case is at the rate of £160 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when the appointments will be for a period of 6 months. Applicants who may become qualified in October will be considered.

Applications should reach me by Saturday, 14th October.

L. PARKHOUSE, Secretary and Manager.

CITY OF MANCHESTER. Monsall Hospital for Infectious DISEASES: (600 Beds.) Applications are invited from registered medical practitioners, Male or Female, for the appointment of SENIOR RESIDENT ASSISTANT MEDICAL OFFICER (B1), vacant 2nd October, 1944. The appointment will be temporary for the duration of the war. Preference will be given to candidates who have held resident surgical and medical posts in general hospitals. The basic cash salary scale commences at £350 p.a. and rises by annual increments of £25 to a maximum of £450, plus a temporary cost-of-living wages addition, with board, residence, and laundry in addition, subject to the Manchester Corporation conditions of service. Suitably qualified R and W practitioners holding B2 appointments, also R practitioners now holding B1 and rejected by the R.A.M.C., may apply.

Full information and forms of application may be obtained from the Medical Officer of Health, Hospitals Administration Section, P.O. Box No. 399, Town Hall, Manchester, 2, and applications must be received by him not later than 26th September, 1944. Canvassing in any form is prohibited.

R. H. ADCOCK, Town Clerk.

Town Hall, Manchester, 2, 2nd September, 1944.

ROYAL INFIRMARY, Preston. Applications are invited for the temporary post of CONSULTANT OBSTETRICAL OFFICER (during the absence on military service of the permanent holder) for the Joint Scheme of Maternity Services. Duties—at the maternity hospitals belonging to the Infirmary, and the Preston Corporation, and also the antenatal clinics of the Lancashire County Council—to commence 1st October next. Candidates should hold a postgraduate degree in obstetrics. Salary at the rate of £1000 a year, plus travelling expenses.

Applications, stating age, qualifications, and experience, accompanied by copies of 3 testimonials, to be forwarded to: JOHN GIBSON, Superintendent and Secretary, at the Royal Infirmary, Preston, by the 18th September, 1944.

KING EDWARD VII HOSPITAL, Windsor. Applications are invited from registered medical practitioners, Male and Female, for the appointment of RESIDENT SURGEON (B1) in charge of Casualty and Accident Service Departments, both In- and Out-patient. VACANT immediately. It is desirable that applicants should hold the qualification F.R.C.S. Salary is at the rate of £300 p.a., with full residential emoluments. Suitably qualified R and W practitioners holding B2 appointments, also R practitioners holding B1 and rejected by the R.A.M.C., may apply.

Applications, stating age, qualifications with dates, and nationality, together with copies of 3 recent testimonials, should be sent as soon as possible to: G. WESTON, Secretary.

NEWARK TOWN AND DISTRICT HOSPITAL. (70 Normal Beds.) Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A), now vacant. Salary is the rate of £200 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply. Appointment will be for a period of 6 months.

B. C. DION, Secretary-Superintendent.

CAMBORNE-REDRUTH MINERS' AND GENERAL HOSPITAL, REDRUTH, CORNWALL. Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A). Salary at the rate of £200 p.a., with the usual residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications, together with copies of 3 testimonials, to be addressed to: J. C. FIELD, Secretary-Superintendent.

Redruth, September, 1944.

THE ROBERT JONES AND AGNES HUNT ORTHOPÆDIC HOSPITAL, OSWESTRY. (540 Beds.) Applications are invited from registered medical practitioners, Male or Female, for the appointment of RESIDENT HOUSE SURGEON (B2), now vacant. Salary £200 p.a., with full residential emoluments. R and W practitioners who now hold A posts may apply, when appointment will be limited to 6 months.

Applications, stating age, nationality, qualifications, &c., with copies of testimonials, to be forwarded at once to—

JOHN C. MENZIES, Secretary-Superintendent.

SURREY COUNTY COUNCIL. Kingston County Hospital, Wolverton-avenue, KINGSTON-ON-THAMES. Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A), 2 vacancies. Salary is at the rate of £120 p.a., plus full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months; otherwise will not exceed 1 year.

Apply to the Medical Superintendent by 20th September, 1944.

NORTHUMBERLAND COUNTY COUNCIL. Hexham Emer-GENCY HOSPITAL. (640 Beds.) Applications are invited from registered medical practitioners, preferably holding a higher qualification in surgery, for the post of ORTHOPÆDIC RESIDENT SURGICAL OFFICER (B1). Duties will be in connexion with the Orthopædic Centre established at the Hospital. Salary is at the rate of £550 p.a., together with full residential emoluments, and is terminable by 1 month's notice on either side. Suitably qualified R and W practitioners holding B2 appointments, also R practitioners now holding B1 and have been rejected by the R.A.M.C., may apply.

Applications should be forwarded to—

J. B. TILLEY, County Medical Officer.

County Hall, Newcastle upon Tyne, 1.

WESTON-SUPER-MARE GENERAL HOSPITAL. (100 Beds.) Applications are invited from medical practitioners (Male and Female) for the appointment of HOUSE SURGEON (A), duties to commence immediately. Salary is at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may also apply, when appointment will be for 6 months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of 3 recent testimonials, should be addressed to: LESLIE J. FURSLAND, Secretary.

THE PRINCESS MARY MATERNITY HOSPITAL, 1, Jubilee-road, off City-road, NEWCASTLE UPON TYNE, 1. Applications are invited from registered medical practitioners (Male, unmarried) for the appointment of RESIDENT OBSTETRIC OFFICER (B1), tenable for 1 year, renewable for a period of 3 years. Previous obstetric experience essential. Salary £300 p.a., together with full residential emoluments. Suitably qualified R practitioners holding B2 appointments, also those holding B1 and rejected by the R.A.M.C., may apply.

Applications, giving full particulars, together with copies of 2 recent testimonials, should be sent to the undersigned not later than Saturday, 23rd September. The successful candidate will be expected to take up the appointment forthwith.

R. S. JOHNSON, House Governor.

ROYAL INFIRMARY, Preston. Applications are invited from registered medical practitioners (including practitioners within 3 months of qualification and liable under the National Service Acts) for the following posts:—

HOUSE SURGEON (A) to Consulting Surgeon (recognised for the F.R.C.S. examination).

HOUSE SURGEON (A) to Ophthalmic and Aural Departments with some duties in medical wards (recognised for the D.O.M.S. and D.L.O. examinations).

Salary in each case at the rate of £150 p.a., with full residential emoluments. 6 months' appointment.

Applications, with full details, to be sent to the Superintendent.

THE JESSOP HOSPITAL FOR WOMEN, Sheffield.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (B2), vacant 4th October. Salary at the rate of £100 p.a., with full residential emoluments. R and W practitioners holding A posts may also apply, when appointment will be limited to 6 months. Membership of a Medical Defence Society is a condition of appointment.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of 3 recent testimonials, should be sent to—

DAVID OSWALD, Superintendent and Secretary.

CITY AND COUNTY OF NEWCASTLE UPON TYNE. Shotley BRIDGE EMERGENCY HOSPITAL. (900 Beds.) Applications are invited from registered medical practitioners, Male and Female, for the appointments of HOUSE SURGEONS (A), shortly vacant. The appointments will be for a period of 6 months. Salary at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply.

Applications to be forwarded to the Medical Officer of Health, Town Hall, Newcastle upon Tyne, 1.

BECKETT HOSPITAL AND DISPENSARY, Barnsley. Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE PHYSICIAN (B2), vacant immediately. The salary is at the rate of £225 p.a., with full residential emoluments. R and W practitioners holding A posts may also apply, when appointment will be limited to 6 months.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of 3 recent testimonials, should be sent forthwith to—

ARTHUR L. BOURNE, Secretary-Superintendent.

ROYAL BERKSHIRE HOSPITAL, Reading. Applications are invited from registered medical practitioners, Male and Female, for the following appointments:—

HOUSE SURGEON (A) (General and E.N.T.), as from 1st November, 1944.

HOUSE PHYSICIAN (A), as from the 23rd October, 1944. (Amended date.)

Also RESIDENT MEDICAL OFFICER (A) (Blagrave Branch Hospital) and ASSISTANT to Pathologist as from the 1st December, 1944.

Salary is at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when the appointments will be for a period of 6 months.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of 3 recent testimonials, should be sent immediately to—

H. E. RYAN, Secretary and House Governor.

VICTORIA HOSPITAL, Accrington. Applications are invited from medical practitioners (Male) for the appointment of HOUSE SURGEON (B2). The salary is at the rate of £200 p.a., with full residential emoluments. R practitioners who now hold A posts may apply, when the appointment will be limited to 6 months.

Apply, with copies of 2 testimonials, to Hon. Secretary.

THE STOCKPORT INFIRMARY. (159 Beds.) Applications are invited from registered medical practitioners for the appointment of ASSISTANT RESIDENT SURGICAL OFFICER (B1) (application has been made to convert the post to B2), now vacant. Applicants should have held house appointments and had surgical experience. Salary is at the rate of £175 p.a., with full residential emoluments. Suitably qualified R practitioners holding B2 appointments, and those now holding B1 and rejected by the R.A.M.C., may apply.

Applications, stating age, nationality, qualifications, and experience, with copies of 3 recent testimonials, to be sent forthwith to—

H. G. PRICE, Secretary-Superintendent.

ROYAL SUSSEX COUNTY HOSPITAL, Brighton. (375 Beds.) Applications are invited from registered medical practitioners (Male or Female), including practitioners within 3 months of qualification and liable under the National Service Acts, for the post of HOUSE SURGEON (A), vacant the beginning of October. The salary attached to the post is £175 p.a., with full residential emoluments. To R and W practitioners the appointment will be for a period of 6 months; otherwise will be for a period of at least 6 months.

Applications should be sent to the Secretary-Superintendent. Closing date 30th September, 1944.

JOINT COMMITTEE OF THE COUNTY COUNCILS OF DURHAM AND NORTHUMBERLAND AND THE COUNTY BOROUGH COUNCILS OF GATESHEAD AND NEWCASTLE UPON TYNE for the administration of a Venereal Diseases Clinic at the NEWCASTLE GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the appointment of CLINICAL MEDICAL OFFICER IN CHARGE (Male), which will shortly become vacant. The appointment is whole-time and the successful candidate must not engage in private practice. Salary within the scale of £850–£1000 p.a., according to experience, plus cost-of-living bonus at present £33 16s. p.a. Candidates must have held a previous appointment as venereal diseases officer or must have had suitable experience in modern methods of diagnosis and treatment. The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass the necessary medical examination. The position now vacant is on the fixed establishment of the Joint Committee, but is being filled temporarily at the present time. Candidates should submit with their applications full information as to liability for military service, medical fitness, and position as regards deferment.

Further particulars can be obtained from the undersigned, to whom applications should be submitted not later than 30th September, 1944.

JOHN ATKINSON, Town Clerk, Newcastle upon Tyne, 1.

NOTTINGHAM CHILDREN'S HOSPITAL. Applications are invited from registered medical practitioners for the following appointments :—

RESIDENT HOUSE SURGEON (B1), Woman. Applicants should have held house appointments and had surgical experience.

RESIDENT HOUSE PHYSICIAN (B1), Woman. Applicants should have held house appointments.

In both cases the posts become vacant 1st November, 1944, and appointment is for 6 months at a salary of £220 p.a., with apartments, board, and laundry. Suitably qualified W practitioners holding B2 appointments are invited to apply.

Applications, together with testimonials, stating age, nationality, qualifications, and experience, to be sent to the Honorary Secretary, 1, King John's-chambers, Nottingham, on or before 19th September, 1944.

Selected candidates will be required to attend at the Hospital for a personal interview.

LANCASHIRE COUNTY COUNCIL. Wrightington Hospital, near WIGAN. Applications invited for JUNIOR RESIDENT MEDICAL OFFICER (B2) at the Wrightington Hospital, containing 280 Beds for non-pulmonary tuberculosis (adults and children), 20 Beds for "combined" pulmonary and non-pulmonary cases, and 70 Beds for pulmonary cases. The medical staff consists of Medical Superintendent, 3 Assistants, 2 Consultant Orthopædic Surgeons, and other visiting surgeons. Excellent facilities for reading for M.D. Salary £300 p.a., plus bonus, together with board, single quarters, and laundry. R and W practitioners who now hold A posts may apply, when appointment will be limited to 6 months ; otherwise 1 year.

Forms of application and conditions of appointment from Central Tuberculosis Officer, County Offices, Preston. Mark letters "Wrightington M.O."

COUNTY BOROUGH OF SOUTHEND-ON-SEA. Applications are invited from registered medical practitioners of either sex, including R and W practitioners who now hold A posts, for the following Grade II appointment at the Southend Municipal Hospital, Rochford, Essex :—

RESIDENT ASSISTANT MEDICAL OFFICER (B2), duties mainly obstetrics and anæsthetics. The salary is at the rate of £325 p.a., with full residential emoluments, plus war bonus. The person appointed will be liable to pay superannuation contributions if the provisions of the Local Government Officers Superannuation Acts are applicable. The appointment will be limited to 6 months for R or W practitioners ; otherwise for 1 year, subject to 1 month's notice on either side.

Application forms, obtainable from the Medical Superintendent, Southend Municipal Hospital, Rochford, Essex, should be returned to him as soon as possible. H. J. WORWOOD,
Town Clerk's Office, Southend-on-Sea. Town Clerk.

ROCHDALE INFIRMARY, Lancs. (110 Beds.) The Board of Management invite applications from registered medical practitioners for the appointment of HOUSE PHYSICIAN (A). Duties include work in the Ophthalmic, Aural, and Gynæcological Departments as well as Medical Clinic. Salary £150, with full residential emoluments. The successful candidate must be a member of a Medical Defence Society. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications to : W. WYNNE, Superintendent and Secretary.

ROCHDALE INFIRMARY, Lancs. (110 Beds.) The Board of Management invites applications from registered medical practitioners for the appointment of SECOND HOUSE SURGEON (A). Salary £150, with full residential emoluments. The successful candidate must be a member of a Medical Defence Society. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications to : W. WYNNE, Superintendent and Secretary.

THE ROYAL EYE AND EAR HOSPITAL, Bradford. Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (B2). The salary is at the rate of £180 p.a., including full residential emoluments. R and W practitioners who now hold A posts may apply, when the appointment will be limited to 6 months ; otherwise may be extended.

Applications, stating age, qualifications, nationality, and copies of 3 recent testimonials, should be forwarded to—
ERNEST S. HEAP, Secretary-Superintendent.

NOTTINGHAM GENERAL HOSPITAL. (712 Beds, including E.M.S. Beds.) Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE PHYSICIAN (A), duties to commence on or about 1st November. Salary at the rate of £200 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications to be addressed to the undersigned, stating age, qualifications, experience, &c., together with copies of testimonials. HENRY M. STANLEY,
House Governor and Secretary.

GENERAL HOSPITAL, Nottingham. (712 Beds, including E.M.S. Beds.) Applications are invited from registered medical practitioners (Male and Female) for the appointment of RESIDENT CASUALTY OFFICER (A) for the above Hospital. Duties to commence immediately. Salary at the rate of £200 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

HENRY M. STANLEY, House Governor and Secretary.

GENERAL HOSPITAL, Nottingham. Ear, Nose, and Throat Department (40 Beds) and large Out-patient Department. Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A) for the above Department. Salary at the rate of £200 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications to be addressed to the undersigned, stating age, qualifications, experience, &c., together with copies of testimonials. HENRY M. STANLEY,
16th August, 1944. House Governor and Secretary.

COVENTRY AND WARWICKSHIRE HOSPITAL. Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A). The post, which is for 6 months, is vacant immediately. Salary at the rate of £170 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of 3 recent testimonials, should be addressed immediately to—
S. CECIL HILL, House Governor and Secretary.

COVENTRY AND WARWICKSHIRE HOSPITAL, Coventry. The present holder of the post having suddenly been recalled for his country's service, applications are invited for the appointment of RESIDENT SURGICAL OFFICER (B1). Commencing salary £500 p.a., with full residential emoluments. Suitably qualified R and W practitioners holding B2 appointments, also R practitioners holding B1 and rejected by the R.A.M.C., may apply.

Applications, stating full details of qualifications and experience, &c., should be sent immediately to the House Governor.

BIRMINGHAM ACCIDENT HOSPITAL AND REHABILITATION CENTRE. Applications are invited from registered medica practitioners for the appointment of RESIDENT SURGICAL OFFICER (B1), vacant immediately. Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding diploma of F.R.C.S. Salary is at the rate of £300 p.a. Suitably qualified R and W practitioners holding B2 appointments, also R practitioners now holding B1 and rejected by the R.A.M.C., may apply.

A. A. MACIVER, Secretary.

Bath-row, Birmingham, 15, 1st September, 1944.

BIRMINGHAM ACCIDENT HOSPITAL AND REHABILITATION CENTRE. Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A) for Burns Unit, to become vacant immediately. Salary is at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when the appointment will be for a period of 6 months.

1st September, 1944. A. A. MACIVER, Secretary.

ROYAL WEST SUSSEX HOSPITAL, Chichester. Applications are invited from registered medical practitioners for the appointment of CASUALTY OFFICER AND HOUSE SURGEON (A). Appointment is for 6 months from date of appointment, and includes general surgical, gynæcological, radio-therapy, and physiotherapy work. Salary £150 p.a., with residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply.

Applications, stating age, qualifications with dates, and nationality, supported by copies of 3 recent testimonials, should be sent to the House Governor and Secretary.

VICTORIA HOSPITAL, Burnley. (169 Beds.) Applications are invited from registered medical practitioners for the appointment of 2 HOUSE SURGEONS (A). Salary at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may also apply, when appointment will be for a period of 6 months.

Applications should be sent to : J. E. WHEATCROFT, Secretary.

THE UNIVERSITY OF ADELAIDE. Applications are invited for the ELDER PROFESSORSHIP OF ANATOMY AND HISTOLOGY. Salary £1200, £100 of which is reserved for superannuation. The Professor is required to insure himself also to the amount of £50 annually.

Further particulars from the Secretary, Universities Bureau of the British Empire, c/o University College, Gower-street, London, W.C.1. Closing date for applications 31st October, 1944. Term commences 5th March, 1945.

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MINISTRY OF PENSIONS. Applications are invited from registered medical practitioners for the following appointment at Queen Alexandra Hospital, Cosham, Hants, and Chapel Allerton Hospital, Leeds :—

SENIOR SURGEON. Salary £800 p.a., plus Civil Service war bonus and free board and lodging or an allowance of £100 p.a. in lieu thereof.

Applicants should have had experience in general and orthopædic surgery, preference being given to those holding a higher surgical qualification. Suitably qualified R practitioners holding B1 posts who have been rejected by the R.A.M.C. are invited to apply.

Applications are also invited from registered medical practitioners (Men and Women), including R and W practitioners who already hold A posts, for appointment as HOUSE SURGEONS (B2) at the following hospitals :—

Queen Alexandra Hospital, Cosham.
Llandrindod Wells, Radnor.
Childwall Hospital, Liverpool.
Rookwood Hospital, Llandaff.
Queen Mary's (Roehampton) Hospital, London, S.W.15.
Ronkswood Hospital, Worcester (an E.M.S. hospital administered by the Ministry of Pensions).

The appointments offer opportunities for experience in general and orthopædic surgery. If held by an R and W practitioner the appointment would be limited to 6 months. Salary £300 p.a., with Civil Service war bonus and free board and lodging, or an allowance of £100 p.a. in lieu if permission is given to live out.

Applications are also invited from registered medical practitioners (Men and Women) for the appointment of HOUSE SURGEONS (A) at the undermentioned hospitals, including practitioners within 3 months of qualification, who are liable under the National Service Acts. If held by a practitioner who is liable under these Acts the appointment will be for a period of 6 months.

Salary £150 p.a., plus Civil Service war bonus, with free board and lodging or £100 p.a. in lieu if permission is given to live out.

Newquay Hospital, Cornwall.
Ronkswood Hospital, Worcester, Stoke Mandeville Hospital, Aylesbury. } E.M.S. hospitals administered by the Ministry of Pensions.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of 2 recent testimonials, should be addressed to the Secretary, Ministry of Pensions, Medical Services Division, Norcross, Blackpool, Lancs.

MINISTRY OF PENSIONS. The Minister of Pensions proposes to appoint a further limited number of MEDICAL OFFICERS to the unestablished staff of the Ministry for duties either at Headquarters or in the Provinces, and applications for appointment to these posts are invited from registered medical practitioners (Men or Women) who are ineligible for recruitment either on the ground of age or by reason of being medically unfit.

The initial salary is £750 p.a., plus Civil Service war bonus, with opportunity for increase up to but not exceeding £900 p.a., provided approved services are rendered, for entrants who are not less than 31 years of age. Promotion to higher grades with proportionate higher salaries is possible. The salaries of entrants who are less than 31 years of age would be adjusted according to their ages. Willingness to serve at any station in the British Isles is one of the conditions of service.

On the termination of the war it may be decided to make appointments to established posts and, if so, unestablished Medical Officers then on the staff of the Ministry, who fulfil the prescribed conditions as to age, &c., will be eligible, with others, for consideration.

Candidates selected for interview will be required to attend at Ministry Headquarters for the purpose at their own expense.

The appointment will be subject to the usual Civil Service conditions. Candidates should be registered medical practitioners of not less than 5 years' standing, and have held house appointments in general (preferably teaching) hospitals.

Canvassing through Members of Parliament or in other ways will render the candidate liable to disqualification.

Applications must be made on forms which can be obtained from the Secretary (M.S.), Ministry of Pensions, Norcross, Blackpool, Lancs.

BARBADOS GENERAL HOSPITAL. Wanted :—

(1) HOUSE SURGEON AND ANÆSTHETIST. Salary £600 p.a. Experience in modern methods of anæsthesia essential.
(2) HOUSE SURGEON. Salary £450. Preference given to candidates who have had experience in administering anæsthetics.

In each case quarters fully furnished for a single man, free water, and lighting allowance are provided. No local rates.

The appointments, which are renewable, will be for either 3, 2, or 1½ years, subject to 3 months' notice on either side to terminate the engagement. Candidates should state whether they wish to engage for 3, 2, or 1½ years.

Transport direct to Barbados will be paid, a proportionate part to be refunded if the term of service for which the candidate is engaged be not completed. Return transport paid on satisfactory completion of contract.

Applications, stating age and date of graduation, accompanied by a recent photograph, a medical certificate of fitness at the time of application, and recent professional and personal testimonials, should be sent by air mail to the Medical Superintendent, General Hospital, Barbados, B.W.I., from whom further particulars may be obtained.

Applicants for post of House Surgeon and Anæsthetist should also forward a recent certificate of proficiency in administering anæsthetics as Resident Anæsthetist of a hospital of not less than 200 Beds, or of a post-graduate course on Modern Anæsthesia at a recognised medical school.

Canadian graduates must hold qualifications registrable in England.

Candidates holding a United States degree must be registered in the State of New York. W. GOODMAN, Secretary.

UNIVERSITY OF CEYLON. Applications are invited for the CHAIR OF PHYSIOLOGY. Candidates must have medical qualifications as well as special qualification in physiology. Salary scale : Rs.12,000 p.a., rising to Rs.17,250 p.a.

Further particulars from the Secretary, Universities Bureau of the British Empire, c/o University College, Gower-street, London, W.C.1. Closing date for applications 30th September, 1944.

The services of a Medical Officer of Health holding a D.P.H. are required by the HIGH COMMISSIONER FOR BASUTOLAND, THE BECHUANALAND PROTECTORATE AND SWAZILAND, to assist the Director of Medical Services for the Territories in the formulation of plans for post-war development and in general supervisory activities. The officer would be based at Maseru, Basutoland, but his services would be available for the other two Territories, particularly for the larger native towns in the Bechuanaland Protectorate.

Emoluments : £600 p.a., rising by annual increments of £25 to £900 p.a., with a special duty allowance of £150 p.a.

Quarters : Free quarters are provided or an allowance in lieu is paid.

Passages : A free passage will be provided for the officer, and for his wife and children when shipping conditions permit.

Conditions of appointment : The appointment is pensionable, subject to a probationary period which is normally 2 years.

Private practice is not allowed.

Further particulars and forms of application may be obtained, on application in writing, from the Director of Recruitment (Colonial Service), 2, Park-street, W.1. Completed applications must reach the Director of Recruitment not later than 7th October, 1944.

Works' Doctor required for a large factory in the London area employing several thousands. It is essential that applicant should have had the requisite experience as a Medical Officer in industry. Age between 40–50. Salary, according to industrial experience, from £800 to £1000.—Apply, giving full particulars, to : Address, No. 482, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Wanted immediately, Assistant in Town and Country Practice in Hertfordshire.—For further particulars apply to : No. 464, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Doctors, Male and Female, required for Locums and Assistantships. Vacancies for Hospital Locums and Ships' Surgeons. Practices and Partnerships for disposal.—Write : A. SHAW, Medical Transfer Agent, Premier Buildings, 88, Church-street, Liverpool.

Service Medical Officer, English, Regular, seeks appointment in Post-War Medical Relief Organisation. Age 33. 7½ years' service. Fluent German, good French. Excellent administrative and clinical references.—Address, No. 481, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Will any European doctors, now in England, and willing to give information about infant feeding in respective countries, for a medical woman investigator, address No. 478, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

For immediate disposal, General Medical Practice, London (including small panel), conducted on modern evolutionary clinical research lines. Sale price £1500. Excellent prospects. Suit 2 partners.—Address, No. 463, THE LANCET Office, 7, Adam-street, Adelphi, W.C.2.

PHYSIOTHERAPIST, health reasons, wishes to dispose of Practice, lease of house, 2 fully equipped and well-furnished treatment rooms, S. of E. town. Accept £2500 cash for quick sale. Immediate possession on completion.—Write in confidence, Principals only, to : BOX 89, c/o DIXONS, 43, Gt. Marlborough-street, W.1.

Medical Photographs and Drawings for illustrations, records, &c. —Write for particulars : E. O. SONNTAG, 159, Bickenhall Mansions, Baker-street, W.1. WELbeck 8860.

Microscope, Zeiss monocular. 5 sets of lenses. 1/12 oil immersion. Quadruple Nosepiece. £65 or nearest offer.—Address, No. 479, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

May we send specimen of COMPARATOR STETHOSCOPE for clinical trial? (No obligation); see issue of 18-7-42.—Capac Ltd., 2, Ullswater-road, London, S.W.13.

Microscopes wanted for essential work and war factories; high prices offered. Also Leicas and similar Cameras and "Talkies." Prompt cash.—WALLACE HEATON LTD., 127, New Bond-street, W.1.

Psychological supervision during convalescence. A maximum of 6 patients can be accommodated in physician's home with 10 acres of ground extending to Thames bank. 10 guineas weekly. —Apply Secretary, Weir Cottage, Chertsey. Tel. 2135.

Harley Street and District.—A number of excellent Consulting ROOMS are available for full and part-time use at moderate rents. Particulars on application.—ELGOOD & Co. 1, Bentinck-street, Welbeck-street, W.1. Welbeck 8974.

Rare modern Micro Accessories in stock at Wallace Heaton's Watson Apochromatic 2 mm. Objective n.a. 1·37 oil-immersion, £20. Zeiss Apochromatic 60x oil-immersion "H.I." with iris, latest chromium inverted, exactly as new, with unopened bottle of Zeiss oil, £20. Leitz latest chromium fluorite Objectives, 3F £6 10s., 6a £8 10s. Zeiss Apochromatic 3 mm. nickel, n.a. 0·95, with correction, £10. Compensated Oculars. Watson Holos Oculars x7, x14, x20, each £5. Leitz latest Periplan 15x, £3. Zeiss latest K 10x, £2 10s.; K 20x, £3 10s.; K 30x, £5. Leitz oil-immersion darkground Condenser, in case, £15. Leitz D 0·85 dry darkground Condenser, £10. Wallace Heaton High Intensity Micro Lamp, for darkground and photomicrography. In one unit with best quality mahogany base and transformer housing, £9 9s. Slide rules for all trades and professions—send 1d. for lists.—WALLACE HEATON LTD. (MAYfair 7511—ask for Mr. Cole), 127, New Bond-street, W.1.

THE NATIONAL MEDICAL AGENCY.

Medical Practice wanted, St. Anne's-on-Sea or Preston districts preferred—not essential.

Full details from the NATIONAL MEDICAL AGENCY, 63, Great George-street, Leeds, 1.

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